What's the Big Idea?

"THE International Paper Company has commenced construction on a kraft paper mill at Panama City, Florida, on the Gulf of Mexico. The mill will have an initial capacity of two hundred tons of kraft paper a day and will be one hundred and forty miles east of the new Mobile, Alabama, kraft paper mill which started production last September.

"The Panama City mill will be of concrete, steel and brick and will have two paper machines, each 236" of width, of the most modern design. Provision is being made so that the capacity of the mill can be readily increased from two hundred tons to four hundred tons a day."

Thus reads the opening statement of an announcement released for publication on May 1st by the International Paper & Power Company of 89 Broad Street, Boston, Massachusetts.

This announcement has been received throughout the length and breadth of the paper industry in America with dumbfounded astonishment—and that astonishment is well founded.

The paper industry, particularly the newsprint and kraft divisions, are wallowing in the throes of a profitless, overproduction condition. In these two divisions of the industry, the International Paper Company has taken the conspicuous and unchallenged leadership in overproduction.

The entire newsprint output of the continent, aggregating some three and one-half million tons, is sold at a price on which nobody—not even the International Paper Company—can make a profit, and yet, the International Paper Company continues to increase newsprint production in the face of a demand that is 70 per cent of capacity. And in the kraft paper division, this same company is continuing to build new mills in face of the fact that the demand for its own product, including that of the rest of the industry, only averages about 60 per cent of the total kraft mill capacity of the country.

In face of these indubitable facts comes the above announcement of the building of another two hundred ton unit of an ultimately four hundred ton a day mill, the addition of which tonnage to the already deficit-making overproduction overload, will put the overproduction percentage in relationship to consumption well over 50 per cent.

No wonder the trade reads the above announcement with dumbfounded astonishment.

What's the big idea?

What reason does the International Paper Company give for the continued building of newsprint and kraft paper mills in the face of such impossible profit-making conditions?

You may read the entire announcement and not one reason is put forth to justify this new construction.

We are compelled to believe by an intimate examination of the production and market conditions of both newsprint and kraft paper that the construction of new mills at this time is but a wilful costribution to the demoralized conditions obtaining in the newsprint and kraft paper divisions.

But—there is the announcement—the construction is going on—there must be a reason for it in the minds of the constructors. What is it?

E D I T O R I A L

"The International Paper Company is not its own master. It is merely a money-losing subsidiary of the International Paper & Power Company, a holding company formed last year when newsprint prices were bad and it became obvious that more valuable than International's coniferous forests were the rivers that rushed through those forests with vast potential horsepower."

Other subsidiaries of the International Paper & Power Company are the New England Power Association, the International Hydro-Electric System and the Canadian Hydro-Electric Corporation, Limited.

"The International Paper & Power Company is primarily a power combine, nowadays affiliated with potent finance."

Therefore, the International Paper & Power Company is an "ambidextrous" concern—that is, it has two large hands to its huge corpus. **Paper** is one, and **Power** is the other.

However, paper is profitless, but power pays. Hence, by joining the two hands through the medium of the powerful body, profitless paper is sustained by paying power. Profitless paper can be indefinitely held at a cost—or below cost—price basis until the last competitive paper manufacturer has been liquidated and the International Paper & Power Company automatically becomes the established paper monopoly of the country.

Who is to say this growing, six hundred and sixty-one million dollar asset corporation nay?

Certainly not the provincial governments of Canada nor the Federal Trade Commission to whom both have been appealed.

Both have had a "bout" with the "ambidextrous" concern and the "exciting bout with the Trade Commission has already been nearly forgotten by him."

And who says that the cost—or below cost—profitless paper price level is not to be held indefinitely? Let the following excerpt, published in May, 1930, give the answer:

"Newsprint is sold to-day for $55.20 per ton. **Paper men are unanimous in asserting that newsprint cannot be made and sold at a profit at such a price.** Canadian manufacturers, exclusive of International, announced late in 1929 that the price would go up to $60.00.

"The International rigidly refused to join in this price elevation.....The Canadian government made a threatening gesture in the direction of International by outlawing all cutting of timber by companies who did not agree to advance the rate to $60.00 **but the International still held out.** Though many a competitor might like to see International out of the industry, the Dominion has equally cogent reasons for not wanting to see International out of Canada. **The advance in price did not go through."**

And, there will be no price advance in newsprint in 1930, and little likelihood of any advance in 1931, 1932 or 1933.

With the newsprint price level below cost and a non-profitable price level on kraft paper both to be indefinitely maintained by the International Paper Company, the rest of the papermaking fraternity can be effectually liquidated and in the end, the International Paper Company emerge supreme.

Let us call another witness to testify to the pride of the imperial paper and power conquest:

"The International Paper Company."

"This is the empire of the International Paper Company, one of the largest single industrial holdings in the world. Beside its 33,540 square miles, the plantations of Ford in South America, Firestone in Liberia, the United Fruit Company in the Carribean, seem insignificant.

"Thus, the International Paper Company is an enterprise sufficiently vast to fill the attention of most men. But for the last few years, its president has fought the battles of paper and pulp **with one hand** while **with the other**, he has built up a second enterprise equally gigantic and at first glance unrelated. The International Paper Company is now the world's chief producer of newsprint; its new parent (1928) the International Paper & Power Company, is one of the world's largest producers of power."

There you have it! Therein, mayhap, lies the explanation for the continued building of huge paper producing units which add production to the gross overproduction, which in turn continues to depress prices to below cost, which in turn will overwhelm the International's paper competitors.

Is there no escape for the independent manufacturer of paper who has no "paying power" to offset his International-imposed paper losses?

We think there is.

An Outline of Paper History

IN the preceding instalment of our Outline of Paper History it was noted that the invention of the beating engine by a Hollander in 1750 was one of the outstanding developments in the history of paper production. To this day the machine goes by the name of hollander, as well as beater.

The next great epoch in papermaking dates from the invention of the continuous papermaking machine by the Frenchman, Louis-Nicolas Robert, in 1799. The machine was improved in England by Bryan Donkin and the Fourdrinier brothers,

A PRIMARY PHASE

in which the bulk of the encrusting impurities are removed without bleaching them;

A SECONDARY PHASE

in which the small residue remaining in the fibre is completely bleached out.

This is the *principle* of

TWO PHASE BLEACHING

The *result* is

THE HIGHEST EFFICIENCY

yet obtained in any commercial bleaching process.

PULP BLEACHING CORPORATION

200 Fifth Avenue, New York City, N. Y.

EDITORIAL

the wire cloth being now generally identified with the name of Fourdrinier. It is of general historic interest to note that Robert served in the American War of Independence, having been attached to one of the regiments organized by General La Fayette for service with the American troops under George Washington.

Robert's continuous papermaking machine was a small affair, taking up less space than a beating engine of half a ton capacity. The beaten pulp was thrown by a revolving paddle, on the moving surface of a wire cloth which was joggled to give it a motion resembling that imparted to the suspension of fibers in the old handmade process after it has been lifted out of the pulp vat in the mold or deckled sieve on which the paper is formed. This is perpetuated in the "shake" of the modern fourdrinier. While a roll of paper made in the modern way may measure eight miles in length, the original Robert machine was not equipped for a roll greater than fifty feet.

Up to that time paper was made resistant to the absorption of fluids like writing ink by dipping the sheets in a solution of glue or gelatin, a practice which was continued until the important discovery in 1806, by Moritz F. Illig, a papermaker of Erbach in Odenwald, of the sizing properties of rosin. The theory and practice of his discovery were described in a brochure issued by him a year later. Illig's ideas of the sizing properties of rosin were different from those that are entertained to-day. He had the notion that the rosin acted to prevent the penetration of ink in a mechanical way by filling up the pores of the paper. Alum was used by him as a convenient source of sulphuric acid to salt out the rosin from its combination with the soda used to dissolve it, the soda being considered merely as a solvent. It was later shown that rosin is a weak acid and that a soluble resinate of soda is formed by the interaction of both substances. New light has since been thrown on the phenomena of sizing by a study of physical and electrical conditions from the standpoint of the colloid chemist. The subject is admirably treated by Dr. Rudolf Lorenz in his paper on "Colloid Chemistry in Papermaking," reproduced in another part of this issue of THE PAPER INDUSTRY.

Next in importance among the landmarks in the history of papermaking is the invention of mechanical pulp or goundwood. The discovery is generally credited to Friedrich G. Keller, a weaver of Haynich, Saxony, and dates from 1842 or 1843, as he is credited with the production in 1843 of the first sheet of pure wood paper manufactured. Keller's claim to priority of invention has been disputed by the Nova Scotia Historical Society which gives credit to Charles Fenerty, a native of Upper Sackville, N. S. On a tablet erected in Nova Scotia to commemorate Fenerty's invention, it is stated that after experiments dating from 1839, Fenerty produced paper from spruce-wood pulp and made his discovery public in 1844. Fenerty died in 1892.

The Way to Get Orders

THERE appeared in a recent issue of one of the New York daily papers, a letter written by a man from Schenectady, New York, which deserves a place in the literature of an art, which many men are finding it a bit hard to practice just now.

He writes: "I am getting sick and tired of reading about the 'Calamity Janes' blaming the lack of business on the recent Stock Exchange slump. It is not due to any such cause, but it is primarily due to the lazy average salesman."

"One day I called at the office of a company in Hartford and I was told by 'that Calamity Jane of all Calamity Janes, the purchasing agent,' that they were not buying anything, but that did not deter me from my purpose. I told him that I did not want to sell him personally anything but did want to see the superintendent to plant a few seeds."

"While I was waiting for that gentleman to appear, four other salesmen came and went away discouraged. I stayed and sold two machines. In Providence, I bided my time, while the salesmen ahead of me cried on the superintendent's shoulder for 25 minutes, and then I sold another machine. My advice to manufacturers is to give their salesmen h—— and tell them to sell goods and not cry poverty."

To such salesmen, depressions in business offer no terrors and sales resistance means no more than a brick wall would to an army tank.

For a salesman to start out on a trip, having his mind made up that business is bad and that he is not likely to get any orders is the easiest way to return empty-handed, but to go out with the determination that this salesman had, and realize that the people that he calls on need his equipment or the product of his company's mill and forgetting that there is any depression in business —only knowing that if most people he called to see purchased his company's product, it would be profitable to both the seller and buyer.

If every salesman could realize that he is an embassador of prosperity and good times, instead of realizing that there is a depression and that most people do not want to buy, there would be more orders taken and the depression would be a thing of the past.

It takes real men to do real work in times of stress. Anyone can sell goods when everybody wants to buy. It takes a real man to sell equipment to a firm that thinks that they can get along without it even though it may be a real method for such firms to save money. But it can be done.

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Colloid Chemistry in Papermaking

Capillary-Physical and Colloid-Chemical Phenomena Explained by Eminent European Authority in Forthcoming Book

DR. RUDOLF LORENZ, lecturer at the Technical College, Dresden, Germany, has contributed to Dr. Jerome Alexander's forthcoming third volume of COLLOID CHEMISTRY (Chemical Catalog Company, New York, publishers), a chapter on "Colloid Chemistry in the Paper Industry," from which THE PAPER INDUSTRY is kindly permitted to reproduce the accompanying extracts.

The chapter begins with a quotation from the opening sentence of a popular textbook of papermaking reading: "Papermaking is essentially a mechanical process." In opposition to this, Dr. Lorenz proceeds to show that while papermaking machines generally are built on the principle of a mechanical contrivance for the dewatering of paper pulp, the papermaking art is really a capillary-physical and colloid-chemical process.

Colloid-Chemical Factors

The mechanical processes of suspending and screening the beaten fiber are not the prime essentials to the formation of a moist web of paper; otherwise it would be possible to produce a mat-like paper out of mineral suspension on paper machines equipped with very fine-meshed wires.

The mechanical power driving the paper machine does not produce paper; this power does nothing but pass the sheet of paper through the different parts of the machine and over and under the drying cylinders.

On the contrary the web or matted sheet of paper is built by the **surface powers of vegetable fibers.** The best paper machine would be useless if the fibers did not adhere together in a sheet capable of being pressed by rollers and carried on felts. On cylinder machines the stock is dewatered. Paperboard being manufactured from repulped waste paper which is chiefly groundwood, advantage is taken of the variations in capillary adhesion as a means of conveyance; that is for the automatic carrying of the moist mat from the wire-covered drum to the felt belt and from there to a polished metal cylinder at the dry end of the machine.

This transfer, or act of "couching," as it is termed by papermakers, must be regarded as a capillary-physical action. There is no molecular attraction, the couching effect depending chiefly upon the condition of the surfaces pressed together and on the water content of the fiber mat as induced by the swelling of the fibers.

It is necessary that the couching surface be smoother than the surface from which couching is to be done; for the smoother this surface is, the smaller is the volume of the capillaries filled with water and air, which means that they have more activity. By the pressing of the couching surface upon the rough surface of the moist paper web, almost always a hollow will be equal with a hollow and only very seldom will top and hollow fit into each other. The roughest part is the wire cylinder with its relatively large openings. The felt being in a finer capillary condition pulls the web of paper away from the cylinder, but has to convey it to the smooth-polished drying roll.

Extent of Capillary Powers

Let us try to estimate the extent of the capillary powers which are effective while couching. In a treatise published in the KOLLOID-ZEITSCHRIFT under the title "Capillary Phenomena" K. Schultze defines a rough surface like a moist web of paper as "system of **open** capillaries." By pressing the couch roll on it **closed** capillaries will result. Mr. Schultze

has measured in some open and closed capillaries made of glass and of equal width the height of suction, or measure of the activity of capillarity in **unmovable** capillary spaces. Corresponding to this height of suction, between **movable** capillary walls there acts the pressure by which these walls are pressed together; that is, by means of the activity of capillarity.

Colloidal Phenomena on the Fourdrinier

Capillary-physical indications are also found on the endless wire of the fourdrinier machine which corresponds to the wire-covered drum of the cylinder machine. Here the water which is inhering only occlusively and capillarily is dropping down while the swelled layer of fibers that compose the web is being formed.

In his HANDBOOK OF PRODUCING AND USING PEAT, A. Hausding speaks of a "strange **natural** desire of pappy, tenuously subdivided cellular and fibrous stuffs to arrange their tiny particles close together while the water is evaporating and of reducing their volume, that is of shrinking or shriveling together, at a rate equal to that at which the water evaporates."

With paper, a similar process takes place on the carrying felts and on the heated drying cylinders where the sheet is finished by further reinforcing of the shrinking fibers. The hot dryers induce a coagulation of the gel-like cellulose that is only slowly reversible; in this way they are freeing and evaporating the colloidally combined water, which cannot be expelled either by arrangements of pressure of the dandy roll, of suction of the vacuum boxes below the wires, or by means of the capillary action of suction of the felts carrying the web of paper. Overdrying is to be avoided; indeed, the paper is sprinkled before it is reeled at the end of the machine. An overdried mat of fibers could not be evened out by the succeeding calendering to obtain a well glazed sheet; the papermaker says that "well dampened is half glazed."

Stretch in Drying

Care must be taken of the shrinkage which ensues when a strip is spread out. This, according to experiments reported by P. Klemm, may amount to 3 per cent in length. It can be overcome to a certain extent by regulating the speed of the single cylinders of the paper machine. By failing to do this it may happen that the sheet of paper will snap and be torn on the machine. The better fibrillated and hydrated the sheet is, the more it will be capable of taking on a good formation during the process of manufacturing, and the more it will be capable of stretching. Of course this extension in length will partly reduce the width.

As is well-known in practice, the degree of shrinkage varies according to the thickness of the paper and the condition of the used mixtures of fibers. The speed of rotation of the single rolls must therefore be adjusted by means of conical pulleys or, as it is done with modern machines, by regulating the sectional electric drives which move the single cylinders. It is interesting to note that the colloidal processes in the web of paper suggest a direction for the mechanical construction of papermaking machinery.

Explanation of "Slow" Pulp

Having studied the workings of our paper machines we have seen that capillary-physical and colloid-chemical phenomena are the principal factors of papermaking. However, an old saying of the papermakers is that: "Paper is made in the beater," in which the stuff is prepared for the paper machine and takes up the water to be removed again on the fourdrinier wire.

C. G. Schwalbe made the first systematic colloid chemical research on the "hydration" of paper stock in the laboratory, using a small model beater. R. O. Herzog and J. R. Katz made experiments by x-ray photographs concerning the swelling of the cellulose. Swelling begins on the surface of the fibers, extending gradually to the interior surface, i.e., in the tubular spaces of the cellulose fibers when these are absorbing water and the enclosed air bubbles are being given off. The swelling proceeds by actual contact of the fibers with water. As an example it may be noted that pulp left in the beaters over the week-end always works "slower" on the machine on Monday than similar pulp produced without such storage. According to Schwalbe the maximum of swelling is reached in from six to nine hours.

"Dead Beaten" Pulp

If intensive mechanical work with a lowered roll is carried on in the beater, the fiber becomes "dead beaten" through conversion into a homogeneous mucilage, which becomes hard and horny while drying, thus producing a structureless stuff. This mucilage or mucus is technically important, because if it is mixed in certain proportions with the pulp it increases the strength and the resistance of the resulting sheet of paper to the penetration of writing and printing inks.

The papermaker has always been aware that an alkali will assist in swelling or hydrating the pulp. In the production of certain Swedish kraft papers, made of soda sulphate celluloses, a part of the alkaline cooking liquor used for boiling the wood is left in the fiber pulp instead of being washed out or neutralized, with the intention of assisting the disintegrating action of the kollergang or edge runner which reduces the pulp ready for the beater by means of revolving stones, neutralization being effected at a later stage. The papers made by this process have the advantage of extraordinary strength. Apparently the content of rosin and fatty

substances of the half-stuff are peptized by this treatment and improve the quality of these papers.

Colloidal Factors in Barking of Wood

One's knowledge of the colloid chemical relations of the raw material should not be limited to fibers or half-stuffs, but must start in the forest where the supplies of wood for papermaking are found. A work by H. Wislicenus shows that the growth of wood is typically a colloid chemical process of adsorption. The first technical treatment of the cut wood that interests the papermaker is also a colloid chemical based process, namely the barking of the wood. The easy and satisfying barking without any loss of ligneous substance has a relation to the swelling condition of the cambium layer. While the ascent of the sap is going on from May to June or July the bark is easily removed. This refers not only to logs cut in summer, but also to timber cut in the fall or winter and subsequently stored. These are also easily peeled and in a shorter time.

Colloid Chemistry in Cooking

The wood digesting processes are also involved in colloid chemical phenomena. At first a saturation of the chips of wood is caused by the digesting liquor diffusing through many of the overlying films of the wood fibers. This diffusion is accompanied by swelling or distention. It has been found practicable to effect these saturations and distentions at a rather low temperature, say, 100 deg. cent., especially in the soda and sulphate processes. The mucus substances being set free during the cooking of the wood, the pentosans appear to retard the dissolution of the incrusting nonfibrous parts of the wood by gluing up and closing the diffusible membranes on the surface of the chips. Faulty digestion will therefore take place and undercooked pulp will be obtained if the alkaline cooking liquor is not used in sufficiently concentrated form as to dissolve those incrusting materials and the mucus substances as well.

Effect of Storing on Pulps

On the other hand, trouble will ensue from shrinkage or "dehydration." Thus, if mechanical pulp is exposed too long to the rays of the sun during storage, it will become unfit to produce paper of a good look-through. Prolonged soaking will not remedy the condition, as deswelling (dehydration) becomes partly irreversible. In the same way, at least by excessive swelling, a chemical pulp which has been stored for any length of time in a moist place, will produce a rather opaque paper, as compared with freshly prepared cellulose, in paper mills having a chemical pulp plant of their own.

An advantage is gained by influencing the swelling condition through heat when grinding wood. By means of the so-called "hot grinding" at a temperature of 70 to 80 deg. cent., fibrillation was effected in the longitudinal direction of the fibers, thus favoring the production of a "wetter" pulp of increased pliability, felting quality, toughness and strength. In producing brown mechanical wood pulp the sticks are steamed in closed boilers before being ground. In this way the incrusted lignin and resinous matter are partly swelled up and partly dissolved, the fibers being loosened so that they readily grind to pulp under the action of the grinding stone and produce a very long-fibered, strong stuff, well adopted for use in manufacturing leatherboard.

At the same time it is interesting to note that the cellulose fiber itself is deswelled or dehydrated and shrunk by heat; the frictional heat generated in the beater causing wood fibers to shrivel and give up water. Advantage is taken of this by the paper machine man when the stuff is "too wet" beaten, when the sheet adheres to the couch and press rolls. In such cases it has been found practicable in some mills to inject steam into the stock before it flows over the wire, which serves the purpose of making the pulp "freer" and enables it to pass over the machine without sticking or picking.

Freeness Tests

C. G. Schwalbe found measurements of viscosity not altogether advisable. But curves of freeness of the pulp seemed practicable in research experimentation. A measurement of the freeness with which water leaves the pulp determines the inverse ratio of viscosity. If a capillary of constant width and fluids of variable viscosities are provided in an apparatus for the measurement of viscosity, variable capillaries of variable width are measured inversely by means of a fluid of constant viscosity in an apparatus for measuring the freeness of a pulp, that is to say, the rate at which water leaves it.

The skilled beaterman dispenses with the use of a freeness test. He "feels" the stuff by continually squeezing it through his hands and is able not only to gauge the degree of "wetness" but also the length of the fibers. The Schopper-Riegler freeness or slowness tester is, however, commonly used in most mills. The state of hydration or swelling of the stuff is estimated on the ratio of the amount of water which is freed from beaten pulp quickly, representing "free" or "quick" beaten stuff, against the amount which is liberated slowly, indicating "wet" or "slow" beaten stuff. The free beaten stock consists of elastic fibers of a low degree of swelling, whereas the wet beaten stock is very pliant if not smeary stuff, being swelled to a high degree.

Operation of Freeness Tester

A certain portion of the fiber stock is taken from the beater and put into a container having an open base that is closed by a conical valve, the bottom of which is covered with a fine wire gauze sieve. The upper part of the apparatus fits tightly into a fun-

nel-shaped chamber having two openings in its lower part, one vertical, the other slightly higher up, running off at about 45 degrees. Below the two openings two graduated glass cylinders are placed. The lower vertical opening is thin, like a nozzle. If the water is running down quickly it cannot pass rapidly through the nozzle and flows through the upper neck into the graduated vessel below. If the water drops slowly it will fill up the other graduated cylinder standing below the nozzle. A comparison of two levels in each of the two graduates gives an idea of the freeness or slowness of the stuff in conventional figures.

Measuring the Swelling of Cellulose

Mr. Vieweg put weighed quantities of different celluloses of cotton for a specified time into soda lye of uniform concentration, while keeping the temperature constant. By diminishing the titre of the lye caused by adsorption of sodium hydroxide by the fibers he estimated the swelling capacities of the celluloses. A similar method is the determination of the copper number by putting the fibers into Fehling's solution and using the amount of copper incapable of being washed out for a measurement of the swelling degree. This method cannot be used for testing stuffs containing incrusted ligneous materials, or for groundwood, as faulty results would be obtained. Mr. Schwalbe and his collaborators, Mr. Behringer and Mr. Becker, tried a third method of adsorption by fixing the capability of adsorption of the fibers for hydroxides of chronium, iron and aluminum from solutions of the acetates of these metals. Coloring experiments, especially with diamine blue and methylene blue, serve to make the formation of mucilage visible while beating; the tint of color darkens in proportion to the slowness of the stock.

Study of Fillers Used in Papermaking

Addition of fillers, colors and gluing or sizing substances are made to the fiber stock. Minerals are used for loading paper to obtain special qualities or characteristics. Thus the so-called "noiseless" paper for concert programs is made smooth and pliant in order to avoid a crackling noise while folding or turning the pages in a concert hall. This is effected by the addition of fillers which reduce the natural harshness of the fibers. Loading is also essential for improving the color, and augmenting the printing properties of the paper.

Colloid Behavior of Dyes

Concerning the colloidal chemistry of paper tinting this bears an almost identical relation to cotton dyeing. As a general thing the capacity for adsorption with wool and silk is greater than with the vegetable fibers of cellulose, as linen, cotton, woodpulp, etc. Many coloring substances used by the papermaker are colloids and can accordingly be fixed by electrolytes. As has been stated, the fiber is charged negatively in water. Acid coloring materials, as Congo-red, being colloids charged negatively, are repulsed by the fibers. Basic coloring materials, e.g., night blue, being charged positively are attracted and adsorbed by the fiber. The adsorption itself reduces the electric charge of the fibers and will cease after the charge is neutralized. If there is a neutral salt electrolytically dissociated in contact with the fibers, the effect of this will be to diminish the electrical potential difference between the solution and the paper stock. As a consequence neutral salts diminish the repulsion of the negatively charged coloring material, which is to say that they favor adsorption, whereas the adsorption of positively charged substances is lessened.

According to tests reported by Fichter and Sahlbom, strips of filter paper may be used to determine whether colloid colors are charged either positively or negatively by noting the height of capillary suction of the color solutions. A negatively charged color will rise together with the water of its solution, a positively charged one flocculates closely over the level of the water, forming a distinct boundary, whereas uncolored water rises in the tube.

By means of impregnating paper with a sol of aluminum oxyhydrate, Dr. Lorenz has succeeded in charging paper positively so that positively charged colors ascend in such a paper and negatively charged ones undergo flocculation.

A Test for Paper Sizing

As to colloidal chemistry in paper sizing, Dr. Lorenz observes that all substances used for paper sizing are examples of colloidal bodies; all of them when in colloidal dispersion possess considerable surface area which render them particularly well adapted for the sizing of paper. Paper is sized differently according to whether it is to be used for writing or for printing. The following is a good test for the quality of the sizing: Trace some ink lines on the paper and allow them to dry; the absence of all penetration of ink indicates perfect sizing, whereas in case of defective sizing, even light pen marks run to some extent, so that the lines become indistinct at the edges.

Characteristics of Rosin Size

Rosin size is most in use and most interesting from the colloid chemical standpoint. In the preparation of rosin size it is customary to digest the rosin with approximately half the amount of alkali that is required to effect saponification. The other half of the rosin, which remains in the unsaponified state, is dispersed throughout the solution as free rosin in the form of a colloidal dispersion. This gives rosin solution a milky appearance, hence its name, milk of rosin. But the saponified rosin, which is first

completely dissolved and hence is in the state of a true solution, is also gradually converted into the colloidal condition in the beater, which means that these particles of rosin are increased about 100 times in size. In fact, the resinate of soda is rather completely hydrolyzed as a consequence of the greater dilution that ensues in the beater when the rosin size is added thereto. The resinic acid which is liberated as a result of hydrolysis and which is insoluble in water, undergoes a condensation, with the result that a number of fine particles unite to make a larger particle of colloidal dimensions.

Dr. Lorenz found that the formation of the dispersion and the changes ensuing in the milk of rosin in consequence of its hydrolysis could be measured by stalagmometric methods. It is accordingly possible to follow through the course of these reactions and conversions and express them graphically by curves, so that the extent of the change can be told at any stage of the process.

Action of Alum on Rosin Sizing

The next point to be taken into consideration is what happens to the colloidal solution of rosin when aluminum sulphate is added to the beater. Dr. Lorenz is of opinion that there cannot be formed any appreciable quantity of aluminum resinate precipitate, for in order for that to take place, it is essential that the resinic acid be present in the ionic state in the solution; otherwise it cannot enter into reaction. However, as we have seen, resinate ions are not present to any appreciable extent in the sizing solution after it has been hydrolyzed in the beater. What is found are aggregates of rosin in the colloidal condition, each particle of which is at least 100 times as large as the rosin acid molecules and ions.

It may be thought that resinate is formed on the surface of these colloidal particles of rosin in consequence of a transformation with the aluminum ion. However, even if this be so, the reaction is necessarily limited, because the greater part of the rosin located within the colloidal particles is inaccessible to the action of the alum.

On the other hand, if the rosin dispersion is left in the beater as such, because the particles of the rosin are of colloidal dimensions, a greater part of the rosin is removed with the waste water. Aluminum sulphate acts as a flocculating agent. When carrying out laboratory tests quantitatively, it was found that the trivalent aluminum ion in aluminum sulphate possessed approximately 5,000 times the coagulating potency of the univalent sodium ion in common salt and still 1,500 times more than that of the divalent magnesium ion in sulphate of magnesium. In this way Schulze's rule of the coagulating potency of ions was verified regarding rosin sol.

The fact that salts possess a flocculating action on the rosin suspensions is often very clearly inconveniently manifested when the addition of a hard mill water to the rosin dispersion produces deflocculation or coagulation of the size, or at least makes the clear size cloudy or muddy in appearance.

Effect of Adding Other Colloids

When other colloids are added in the proper proportions to the rosin, as is the rule with commercial sizing preparations, it is possible to regulate the flocculating action of the electrolytes, that is, accelerate or reduce the speed of the coagulating process so as to maintain the particles of rosin in the most advantageous condition of dispersion. The character of the colloid that is added to the rosin suspension is not the only factor to be considered, for it is necessary to take into account the conditions under which these colloids exert their respective actions on the milk of rosin; there are frequently small changes in the method of their use which, while all other conditions remain unchanged, give rise to entirely opposite results. Thus in the case of the addition of casein to the rosin emulsion, the circumstances under which the addition is made may result in complete avoidance of flocculation or may cause it to take place immediately.

This very interesting and at the same time very important bit of colloid chemical knowledge has not been given any attention at all in the practical application of the sizing process. Whenever casein was added to the rosin size, the addition was always made in an empirical manner, without any very definite knowledge of exactly what was going to ensue or without any real understanding of what did take place or any suspicion that different actions could be produced by the addition of this colloid under suitable controlled conditions.

Colloidal Hydrate of Alumina the Active Agent

The aluminum in final analysis is found in the state of colloidal hydrate of alumina. What, then, is the action of this colloid on the sizing process? Does it merely play the part of a mineral filler in the finished paper and can it be replaced by other mineral substances with just as good results, or is it indispensable to successful sizing of the paper?

Experience has shown that when coagulating reagents are used which are absolutely free from aluminum, such as sulphate of magnesium, sulphate of soda, or dilute sulphuric acid which may, at first glance, be expected to give just as good results as sulphate of aluminum because of their powerful coagulating action, the sizing of the paper is not stable; that is, it has been remarked that papers sized in this manner, after being stored for a short time, lose their sizing properties.

Aluminum Resinate Is Not Formed

This seems to indicate that the old resinate theory is positively negatived by our previous observations,

in which it was shown that there was nothing to substantiate the assumption that there was any considerable formation of resinate of aluminum in the beater. But this apparently contradictory phenomenon can be explained in a colloid-chemical way. It is known that cellulose is charged negatively when dispersed in water and that the rosin sol is similarly negatively charged. It is consequently to be expected that these two substances should repel each other electrostatically. On account of the mechanical agitation that is effected in the beater, the rosin and the cellulose fibers are intimately matted together. Hence, when the fritting of the rosin size is carried out on the drying cylinders of the paper machine under correct conditions the network of fibers are covered with an even coating of rosin. But the electrical repulsion that ensues between the cellulose fiber and the film of rosin, occasioned by the similar charges on both, causes a disruption of the extremely thin coating of rosin. The structure of the rosin film is loosened from the underlying cellulose, with the result that fissures are formed in it and the paper is desized. The ink and other liquids penetrate the paper, and the writing or printing runs.

On the other hand, when a colloid which has a positive charge of electricity is distributed throughout the paper, this will approximately compensate for the negative charges on the rosin and the cellulose, and the paper become approximately iso-electric. The hydrate of alumina colloid plays this role in being positively charged. This is always the case when colloidal substances which are oppositely charged are brought into contact with one another. In other words, the hydrate of alumina acts as an "electrostatic cement" between the rosin and the cellulose.

This, Dr. Lorenz says, is his colloid-chemical theory of rosin sizing which has always proved helpful whenever he had to determine and remove sizing difficulties in paper mills.

A Few Facts About Paper Drying

By CAL BARRY

Engineering Department, Bryant Paper Company, Kalamazoo, Mich.

THE drying capacity of all paper machines is limited by two major factors; first, the ability of the dryers to evaporate the moisture from the sheet passing over them and second, the ability of the air passing around the dryers to carry away the moisture evaporated by the dryers.

In order for dryers to perform their function properly, they must be internally free from any coating of material that will interfere with the transfer of heat through the metal to the sheet. The greatest source of trouble of this nature is dirty exhaust steam. The large volume of space in a dryer makes it act as a very efficient separator, and most of the particles of solid that are contained in the steam will settle out by gravity in the dryer. Ordinarily these solids would be of little consequence and would be washed out of the dryer by the condensate, but in combination with the sticky residue of cylinder oil of certain characteristics, may cause considerable trouble. Cylinder oils blended from steam refined stocks may contain certain percentages of tar, asphaltum, paraffine wax, sulphur, etc., in relation to their origin, which will leave these gummy deposits. These oils may be readily recognized by their color, it being anything from dark green to black.

Cylinder oils blended from filtered stocks should be used for the lubrication of all steam cylinders from which the exhaust is used in paper dryers or any similar process. Filtered cylinder oils are identified also by their color, it being dark red and the oils transparent. As the name implies, the difference in these oils is filtering, which removes the heavy objectionable substances found in steam refined cylinder stocks. Filtered cylinder oils are perhaps a little more expensive as to price per gallon, but the quantity used can be materially reduced because filtering increases their automization factor and they will spread over the cylinder surface in a more uniform film than is the case with unfiltered steam refined oils. Film strength is also increased.

The need of keeping the outside surfaces of dryers free from coatings of any nature is really too obvious to mention, but I have seen machines operating that would have produced a much more uniform sheet and a lot greater tonnage if the dryers had been thoroughly sanded.

Keeping the dryer felt tight enough to hold the sheet firmly against the surface of the dryers is also very essential to good heat transfer.

Draining condensate from dryers as rapidly as it forms, is of course necessary in order to get the most good out of the dryers. While it is true that in the dryers of high speed machines, a dryer half full of condensate will suffer only a slight drop in temperature or perhaps none, due to the fact that in changing from steam to water or from water to steam, the change is caused by the absorption or the giving up of latent heat and not by a change in temperature, yet the drying capacity will be greatly impaired. The reason that a water logged dryer will not do any work is that in order to evaporate water from the sheet, it must absorb both latent and sensible heat from the dryer. When we consider the fact that

while steam and water in a dryer operating at atmospheric pressure may both be 212 degrees in comparison with the fact that the water will have a B.t.u. content of 180 B.t.u. per pound and the steam a heat value of 1,150 B.t.u. per pound, it becomes readily

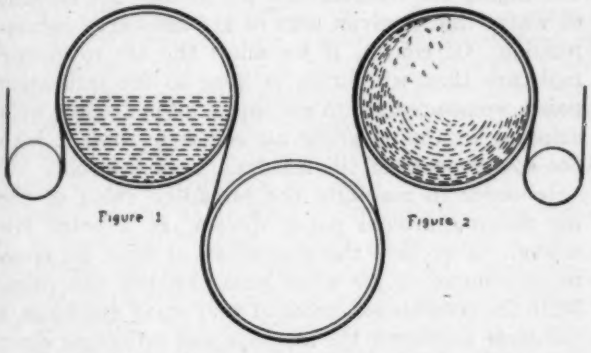


Fig. 1—Waterlogged dryer at rest, showing water half filling dryer

Fig. 2—Illustrating tendency of water in waterlogged dryer to follow up sides of dryer and insulate the metal from the steam. The greater the speed, the more tendency toward complete film

apparent that a water logged dryer will transfer very little, if any, heat to the paper being dryed.

The idea that water in top dryers is of little consequence, due to the sheet being in contact with the top half of the dryer which is in contact with the steam on the inside rather than the water, is very much in error. In a dryer half full of water that is operated at present day high speed, the water will carry up the side of the dryer in the direction of rotation, and will insulate it from the steam inside, to the extent that only a small percentage of the dryer surface will be active.

It should be a periodical routine procedure in the maintenance of all paper machines, to inspect and repair syphons or dippers as the case may be. Five or six can be checked each Sunday according to the number of dryers on the machine and this inspection cycle should be arranged in periods of not over six weeks. It is usually very difficult to spot the offending dryer by its temperature, and routine inspection is the cheapest production insurance procurable. Steam joints, man holes and hand holes should also be very carefully watched on dryers that operate at vacuum pressures, as air leaks and subsequent air binding is one of the greatest bug bears in machines drying at less than atmospheric pressure.

Regulating Dryer Temperatures

In order to produce a sheet of paper of uniform moisture content, we must provide some reliable means of regulating the amount of steam admitted to the dryers. This was originally accomplished manually through the manipulation of valves by the back tender, but in later years myriad schemes to accomplish regulation mechanically have been placed on the market. The results obtained through the use of these various devices has been as variable as the devices themselves.

Most drying systems are designed to maintain a temperature gradient between two or more sections into which the dryers are divided. This is done in order that the comparatively cold sheet leaving the wet end of the machine may first come in contact with a dryer surface of low temperature. The possibility of vapor bubbles forming under the sheet and causing distorted spots in the formation is thus avoided. Bringing the temperature of the sheet up gradually and removing a considerable amount of its moisture before subjecting it to contact with dryers of high temperature, is accomplished by this segregation of dryers into sections in relation to their internal pressure upon which their temperature depends.

Dividing a group of dryers into more than three sections is usually not advisable unless the initial steam pressure in the first section to which the steam is admitted exceeds six pounds, or a vacuum pump is used to bring the discharge pressure to a

Fig. 3—Paper machine with hood over dryers and vapor stacks up through the roof. Large unit type heaters are installed in each end of the machine room, air from the outside being forced through them by fans. This air after heating the room, finally finds its way up the stacks, accomplishing room heating, vapor disposal and excellent ventilation by one operation

value considerably below atmosphere. This is because a pressure differential of at least two pounds is essential to raise the condensate from the bottom of the dryer to the discharge level at the center. This makes it rather impossible to split a total pressure drop through a set of dryers of perhaps six pounds, into several groups and maintain a correct pressure differential in each section when changing from light to heavy sheets and vice versa.

Some manufacturers of drying systems are prone to place great stress on the reflash from the condensate from the high pressure drip header acting as a source of steam supply for the dryers in the lower pressure section. This so-called flash is very largely a myth, and the lower pressure sections are really supplied by the blow through of steam from the higher pressure section with the condensate, a differential pressure valve usually acting as an auxiliary to the blow through.

For proof of this point, let us consider the heat values of steam and condensate and the change due to a pressure drop of from zero pounds to five inches of vacuum. The condensate as it condenses in the dryer at zero pressure will have a B.t.u. value of 180 per pound. Now in discharging this condensate to a five inch vacuum, we reduce its B.t.u. content to 169 per pound. This reduction of pressure liberates 11 B.t.u. per pound of condensate which now becomes available for re-evaporation of flash of a certain amount of the condensate. Further study of the properties of steam show us that in order to evaporate one pound of water having a heat value of 169 B.t.u., it is necessary for it to absorb 977 B.t.u., which is the latent heat content of steam at five inches of vacuum. It is therefore apparent, that as one pound of condensate under the above conditions, can only give up 11 B.t.u.'s, and that as 977 B.t.u's must be added to a pound of this condensate to convert it into a pound of steam at this pressure, that the proportion of the condensate that will flash will be so small as to be of little or no consequence, and obviously, low pressure sections must be supplied with steam from some source other than flash.

Drying at as low a pressure as possible is always to be advised except in cases where the dryer pressure has no effect on the back pressure of the prime mover supplying exhaust steam to the dryers. Under average conditions the steam consumption of an engine is reduced 1 per cent for each pound of back pressure relieved, making the economy of maintaining exhaust pressures as low as possible very obvious.

Evaporation and Ventilation

Assuming that our dryers are in every respect in condition to dry a maximum tonnage, we are then confronted with the problem of disposing of the water that the dryers are evaporating from the sheet. As mentioned in the opening paragraph, this must be accomplished by the circulation of air around the dryers, which will take up the vapor and carry it out of doors.

The ability of air to carry suspended moisture is highly variable and in relation to its temperature. The higher the temperature, the greater the amount of water that a given unit of air can carry in suspension. Of course, if we allow the air to gather moisture that will bring it near to its saturation point, we are certain to get into a lot of trouble with dripping as the outgoing air comes in contact with the cooler parts of the building, near the roof.

In order to maintain the humidity value of the air passing around paper dryers, at a point low enough to exclude the possibility of drip, an enormous volume of air must pass through the room. With the possible exception of very small machines, a complete hood over the machine and extending down over the top row of dryers is a profitable investment. In connection with hooded dryers, outside air forced through steam coilage by fans, is a great aid to moisture removal. The fans tend to increase the atmospheric pressure within the room and to force the warm dry air from over the hood and other parts of the room, to circulate down around the dryers and up through the hood, carrying with it the moisture from the sheet. In no case should inside air be drawn or forced through heating coils, for unless the room is constantly furnished with fresh outside air, recirculation will result and the relative humidity will build up to the saturation point, causing excessive drip.

Steam coilage at the roof, of course, helps to keep the temperature of the air in contact with the roof, above the dew point, but unless waste exhaust steam is available, it is rather an expensive way to accomplish the desired result. Better than roof coilage is a false roof with an air space between it and the roof proper, through which warm air is forced by fans, thus subjecting the air in the room to contact with no cold surface. Neither of these measures are usually necessary in connection with a well designed heating and ventilating system, which is the least expensive as well as the most satisfactory solution to the drip and air removal problems.

Drying being one of the major factors of paper mill operation, deserves a great deal of study by all who are concerned with production and economical operation. It is sometimes possible to make very material improvements in this phase of paper making, steam conservation, greater tonnage, a better formed sheet with a uniform moisture content, being the result of study along these lines.

The world is daily increasing in experimental knowledge, and let no man flatter the age with pretending we have arrived at a perfection of our discoveries.—Benjamin Franklin.

Cost Accounting in the Paper Industry

Part XVI (Cont'd)—Preparation of Accounting Reports

By D. A. WILCOX

NOW we come to cumulative daily reports for foremen. Here again physical statistics play a large part. At this point the cost accountant may timidly express an opinion even of engineering facts, at least so far as the accumulation and expression of figures are concerned. It is recommended that figures of production, etc., be set on the basis of averages per diem; consumption of materials on percentage of production. It will be found that this method gives figures easy to understand and truly comparable from period to period.

Queries and Answers

In order to encourage discussion on the subject of cost accounting in the paper industry, the author of this series of articles is prepared to answer to the best of his ability any queries on cost accounting that may be directed to him.

Aside from physical statistics the costs should refer to total cumulative reports as compared with budgeted costs for the period to date. Thus we would show:

Total actual labor vs. total budgeted labor = variance.

Total actual supplies vs. total budgeted supplies = variance.

Total actual repair labor vs. budgeted repair labor = variance.

The assumption is that as a figure begins to pull out of line, if recognized in time, it can be corrected. Possibly so, maybe so with labor, but quite doubtful as to supplies and repairs. However, as we would rather not miss any tricks and as there might be a chance of their doing some good, we shall put them in.

Consumption of materials is best expressed as a percentage of the production—not as costs at all. By so doing comparisons can be made from year to year without any confusion as to changes in the prices of materials themselves. Steam is also best shown by its use in tons of steam per ton of product.

Cumulative Variances

Cumulative variances may be shown. If so it is best not to state them as "Variances" to the foremen, but to use some less technical, even though longer, term. Thus you can say: "Your department has exceeded the amount set for lime cost by . . . . so far this month." A shorter way to state it would be "Sulphur variance to date . . . ." (and this is why technical terms are used), but unusual words are apt to grate on the foremen and place a barrier between them and the cost men.

Monthly Reports

Suppose we digress for a moment and consider the raw materials with which the cost accountant has to deal in the form of monthly reports. These are the summaries of the variance and other accounts resulting from the month's operations. We have termed these the raw materials of the cost accountant. In some systems, the mistake is made to consider them as the final results and pass them on to the various executives. This is wrong, because for full appreciation they must be analyzed and interpreted to them by some person who fully appreciates what they mean and can tell others in terms which they, in turn, can fully understand.

After the books are closed the accountant should draw off the following statements for his information:

Statement of unearned burden and variances. This shows the total estimated charges for the month for each center; the actual charges; the earned burden and the unearned burden, and the variances from standard costs and finally the combined total of the two.

Statement of operating variances. These constitute the material, price and conversion variances. They show the actual uses at actual prices; the actual uses at standard prices and the differences between the two (the price variances); the standard uses at standard prices and the difference between standard and actual used (consumption variances) and finally the actual earned burden and the standard earned burdens and the differences (conversion variances).

Statement of charges to centers. This constitutes a detailed statement of the charges to the various centers for labor, supplies, repair labor, etc., each actual charge being set under or opposite the standard for such charges. These standards are those on which the rates are set and the totals must agree with the total estimated burdens shown on the statement of unearned burdens and variances.

In addition to these reports the cost accountant must have a full set of operating reports showing production, consumption of materials, losses, etc., to guide him in the preparation of his own reports to the others.

These reports, as previously stated, are but the raw materials out of which the cost accountant makes his reports and, depending upon his vision and ability, works out facts for presentation to others that may influence the entire operation of the plant.

Narrative Reports

We know of no better way in which to present monthly, and other longer periodic, reports than the narrative form. While it is true that certain standardized forms may be used to equal advantage in certain cases, generally speaking, the narrative form is by far the most effective.

The narrative report is, however, a trick in itself. As may be gathered from the name it aims to be a story or narrative of the important events which have occurred during the period under review. It might be viewed in the light of a cost accountant sitting down to write a letter to the recipient giving him a continued account of what he thinks should interest him or what he ought to know. As letter writing is an art, so narrative report writing is an art. How can you gain and hold the interest? Should you be entirely prosaic and matter-of-fact or should you contrive to let a slightly humorous vein creep in? All this will depend on circumstances and the character of your reader. Put yourself in his place. What is he interested in? Give him that and no more, but make the report readable, by dramatizing facts where it can be done without strain. This will often make a deeper mental impression. It is a mistake, however, to make the reports too flowery.

One thing to consider in narrative reports is a proper balancing of tabulated matter with the thing you are giving an account of. If there are a number of figures to present, box them together in a table, rather than to string them along in a sentence or paragraph. Make the form neat to catch the eye.

Give your conclusions first, then follow up with the detailed explanation or tables. It may be desirable to attach an appendix to carry the tabulations; or a combination of interspersed tables and an appendix carrying itemized details may be used to serve the purpose better.

One thing is peculiar. If you throw a lot of figures at a man the full significance of the whole may be missed by him, but if the gist of the calculations are presented in an introductory note, details can follow without harm, because having got his bearings, with a picture of the whole situation before him, he will not be apt to be confused by the enumeration of details.

Monthly Reports for the Foremen

So we get back to our foremen. For a monthly report we can think of no better means than the narrative form. Just sit down with the figures and write him a letter (call it a report if you will) and discuss with him the points of interest for the month. Take up anything you think he should know, but first aim to visualize the man and his job so that you will be able to understand what it is he does want to know.

If this is too much of a job, or if the cost accountant has any difficulty in figuring out what the foreman does want to know, he should draw up a form to fill out showing anything and everything that touches on the particular department, leaving it to the foreman to pick and choose what he wants and to interpret it for himself. This is not what we call cost accounting, the cost accountant's job being to find out what the various individuals want and need —quite different things sometimes!—and give them facts which will aid them, and in a form that can be readily understood.

As no narrative report takes any set form, no special layout can be given, though experience in the preparation of such reports may suggest definite lines to follow. One great advantage of this form of report is the education the cost accountant himself gets in the process of preparing it.

Management Reports

By management reports we mean reports for the general mill manager and his staff. If the mill be but one of a number of units in a large organization these will have to be still further consolidated and another series of reports made out for the general executives of the company, but that is another matter. We are considering here a single mill and reporting only to one mill manager.

What is this man interested in knowing? He wants to see how well the various department heads are fulfilling their responsibilities and how expenses are running. He want to see the results of experiments and to know the possibilities of improvements in the process and equipment, as well as in the progress of new construction. He has to review the whole situation and keep all departments at full speed ahead and properly co-ordinated.

He cannot be nearly as much concerned in the day-to-day operations as are the individual foremen. His is a broader sphere and he must give a considerable portion of his time to planning policies, looking for improvements and "managing." Hence the information needed by him is more general. It must be brief and to the point so that he himself will not be snowed under with a mass of irrelevant detail.

Mill Manager's Daily Report

For a daily report let it be concerned solely with physical statistics showing productions, losses, use of materials by per cent of production, and quality of materials and products. Costs for the day are of little help to him, as he gets more from a cumulative report.

The cumulative report and the daily report can be on the one sheet. Thus for production we can show:

Production per day —— tons.
Average period to date ——.

Costs are best shown by variances. Thus, instead of showing the cost per ton for sulphur, show the total sulphur consumption variance to date. The same

applies to all other materials, supply items, conversion variances, unearned burdens and similar things.

Perhaps the most useful form of daily and cumulative report that the accountant can make is a form by departments and variances, with spaces for various items of controllable expense, but only inserting the figures when they are excesses and writing them in red when they become really important, leaving all other spaces blank. By this means the mill manager would get a daily cumulative report consisting mainly of blank spaces and a few figures, some of them in red for special attention. When he sees one of these he knows it is time to start something. If he has faith in his cost department and believes it to be on the lookout for his interests, he knows there is nothing for him to worry about in the case of the blank spaces and goes on his way rejoicing. His attention is called to the really important things and not distracted by a mess of other figures.

Period to Be Used

What period should be used for the cumulative report? The month to date seems, at first glance, to be the natural one, but really better help can be had from a moving period, that is, one in which a new day is added each day and the oldest day dropped, but always retaining the same total number of days.

To make this come out to agree with the figures at the end of the month, the length of the period would be that of the number of operating days in the current month.

Suppose we are at November 27, 1929. Our period would be of 27 days; we would add the figures for November 27 and drop those of October 27 (26 operating days ago). Averages based on this method are what are known as "moving averages" and are very useful in a lot of statistical work.

The trouble of using the period of the month to date is two-fold, the first being that during the first few days of the month it takes so little to affect the average and thus the effect of any one particular day gets smaller and smaller as the month progresses and the influence of each day is different from those of the previous days, and secondly, the figures for the first few days of the month are not trustworthy averages for showing the trends.

Advocates of the month-to-date basis say that while it is true that for the first week the figures may be distorted, this quickly corrects itself and the system is more "natural" and easy to understand. Well, perhaps, but why be confused even a week a month when it is unnecessary? As to its being easier to understand, all we can say is that management is a science nowadays, and a manager may be expected to understand simple mathematics, or sooner or later his mill will be at a disadvantage as compared with others whose managers employ scientific methods.

The Manager's Monthly Reports

For the manager's monthly reports the best form is the narrative report, but here the management knows better what he wants than the accountant does, hence he must be advised of a number of facts in routine report form as well as by the narrative report, or they may be incorporated in it as special tables, appendixes, etc.

The cost accountant himself must work out for his own benefit quite a number of reports aside from the regular monthly and daily routine reports and should keep a number of facts in chart form to give him various slants on the business and enable him better to interpret it to others. Charts are particularly useful this way, and if possible, it is good for the accountant actually to make them out himself, for in so doing he gets an intimate knowledge of affairs not obtainable by looking over reports and charts made out for him by others. How far these reports and charts are to go, if he lets them go at all beyond himself, depends entirely upon the nature of the information, the character of the men and other factors for him to decide.

Having all these figures at his command, together with special studies and indexes, the accountant is prepared to write a narrative report of the month's operations for the benefit of the management which should throw a spotlight on all phases of the operations and "let no guilty fact escape."

One great trouble with numerous cost systems is that there is altogether too much raw, undigested cost data fed to the management and too little interpretation applied. Some forms and reports handed out remind one of a definition once given of a tariff report by the Senate Ways and Means Committee where the wit said "it was a huge mass of undigested misinformation." Never let this be said of any reports resulting from a good cost system!

Charts

This article would be incomplete without a word as to the use and value of charts. Much of the matter shown here can well be presented to advantage by the aid of charts. But to be of real value the charts should cover as long a period of time as possible. Daily statistics should be chartered on a yearly "calendargraph" form so that the figures for the entire year to date will be visible at a glance. Thus the results at present can be compared immediately with any previous time in the year. Monthly averages are well put on charts divided 12x10, i.e., 12 spaces horizontally and 10 vertically. Chart forms of this kind are available to cover a great many years and are useful to show trends in consumption, production, etc.

Charts should not be made for too short a period, except for special studies. Thus making a monthly chart and using a new sheet for each month is not

nearly so useful as one covering the entire year. Another thing to watch is the scale used, particularly the vertical scale. If it is too small it will be difficult to read and the curve will be too flat; if too large, the fluctuations in the line will be so violent as to make it difficult to interpret. It is better to make them too small than too large because a small scale, if not too small, shows trends better than a large one, as the points are better grouped and the eye follows the general trend much better.

Thus we bring our consideration of the one-product mill to a close. In future article, we shall follow the various systems to be used in multi-product mills, such as specialty mills and the like.

The International Situation in Paper

By KING HAMILTON GRAYSON and W. M. ROSSER
Consulting Research Engineers

This is the conclusion of the series on phases of marketing paper in world markets, and of the competition existing or anticipated, published in the December and March issues of THE PAPER INDUSTRY. The authors made a personal investigation of export and import conditions in various countries.

THE World and its paper business presents a complex for 1930 to 1933 in productive and marketing effort which promises more radical developments than during any of the past ten years. The consumption of paper as a necessary article for human welfare, comfort, and progress must now be reckoned from a purely international mass instead of that of one or two leading nations. Many foreign corners, heretofore, neglected, have recognized their tremendous wealth in untouched forests, waterpower and potential consumer demand. More, new, or greater paper mills are the result, and competitive elements promise to become more intensely keen before the end of 1933.

The Soviets are destined to pay an important part in the paper industry of 1930 to 1933; the Japanese mills are looming competitively; and those of Holland, France, Germany, Scandinavia and all of the Baltic are fighting for business—ever more business. But while the producers are competing to hold old markets, none are seriously encouraging the new and greatest markets of the world—those are being left more or less in a state of self-development. Yet paper has become of international importance, a source of industrial progress, of profits, of almost universal brotherhood—almost as vital as food. And throughout the world, new paper mills are springing forth, or are being planned to share in the world trade of this commodity.

When a new newsprint paper mill at Rouen, France, increases world production by 36,000 annual tons, the world must consume more paper to justify the investment of more than two and a quarter million dollars. When Italy's four hundred mills produce more paper from imported raw materials to sell at competitive prices, the international manufacturers have something to seriously consider; and when the mills of Holland, Japan, and Russia increase their outputs, those of Canada and the United States need to study and watch their markets. What will be the outcome?—1933 will answer. The paper mills of the world—their production and sales during the next three years, are the issue more than that of any single nation. All must get ready because it will result in the survival of the fittest; and the mills of Holland and Japan and of the Soviet Republic are steadily improving upon paper manufacturing efficiency every day.

Holland

Since 1783, the mills of N. V. Vereenigde Koninklijke, Papierfabrieken Der Firma Van Gelder Zonen, of Amsterdam, have been steadily progressing. Their first radical manufacturing change took place in 1845 when the windmill at Eendragt was converted into a mechanical paper mill. It was soon discovered that the water of the district was not suitable for producing pure white paper so another mill was opened at Dpeldorn, in Gelderland where a sufficient supply of clear water was found. This mill then started to manufacture the famous "Old Dutch" paper with small vats and low output. Through the years the business has now developed into one of the largest in Holland. The demand created for that first famous product, in spite of many newer types of paper, still continues at home and abroad.

A second paper industry was started at Velsen on the North Sea Canal in 1895 to manufacture newsprint paper. At the beginning of the present century, this mill increased its production to include manufacture of its own supply of cellulose and wood pulp. In 1912 the increasing demand for newsprint at home and abroad forced the construction of a new mill at Renkum, but previous to this date the Harten Mills at this point had been purchased. The Harten Mills specialized in wood-free writing paper and this branch of the industry has been gradually developed until it is one of the finest in Europe. Recently all of the old type equivalent was overhauled and two large modern paper machines were installed. The mills now operate twenty machines varying in

width between 1.40 meters and 4.20 meters, with an output of 110,000 tons per year. In addition to this, the mills also have an annual production of chemical and mechanical pulp of 45,000 and 40,000 tons respectively. From the meagre start in 1895 the company has grown until more than three thousand workers are now employed with an office staff of over two hundred. The greater portion of their output of newsprint, wood-free writing and printing paper, and wrapping paper is exported to practically every country in the world.

Closely allied with the paper manufacturing business of Holland is the firm of G. H. Buhrmann, Limited, wholesale paper merchants in Amsterdam, The Hague, and all leading cities in Holland. The head offices and warehouses are located between the famous Keizersgracht and Prinsengracht at Amsterdam. The first group of buildings were built in 1621, and are called the "Groenland Storage Houses." They are one of the show places of Holland because of the beauty of past centuries hidden in their architecture. Immediately adjoining these is a second called "The Star Warehouse" of later construction, but soon to be replaced with a modern seven-story fireproof building to meet the ever-growing demands of the firm.

One of the characteristic features of Buhrmann, Limited, has been the combination in their business of historical tradition and the latest modern efficiency. The company was founded in 1866 by the father of the present managing director, and in 1922 was converted into the firm of the present name. The economic operations of the company are centered in the sale and distribution of the most varied types of paper for all purposes. Their orders are not only filled by the paper mills of Holland but by the leading mills of the world. The largest percentage of all paper consumed in the Netherlands is furnished by Buhrmann, Limited, a position which they take pride in maintaining.

To Buhrmann, Limited, belongs the credit as one of the world's pioneers in introducing paper and paper products to the far corners of the earth. They maintain a branch office in Java which is almost as important as the one at home. Large stocks of paper are always available at all of their warehouses in Europe and foreign ports. These stocks include a sufficient supply for immediate delivery of over four thousand distinct varieties of paper, including everything from the most simple packing paper to the most valuable of bank-note stocks or cover material.

In this distribution system of Holland's prime paper wholesalers can be seen an object lesson for paper manufacturers all over the world. Service is the keynote, based upon prompt delivery. Though delivery is one of the important causes for their growing success, Buhrmann, Limited, have given special attention to "business creation." This has included furnishing "sample libraries," attractive examples of printing art, dummies for books, pamphlets, and advertising publications executed in many languages, an efficient house organ, and "paper exhibits" with an educational background to create the desire in foreign countries to "use and buy paper."

Buhrmann, Limited, can technically be termed the Greatest Paper Salesman in the world; and as the result of their efficiency they are now the exclusive agents for many of the most famous paper mills in the world. This includes the distribution in Europe of products from various prominent American mills and factories. In other words, this firm began years ago to create world markets for paper; they have constantly studied world markets and world peoples, educating them to the uses of paper, until today, the marketing avenues are ever-growing feeders for the benefit of the manufacturers all over the world—with one exception—that of the Soviets.

The Soviet

The very foundation principles which have been responsible for the growth of Buhrmann, Limited, are contrary to the principles of operation as set forth by The Soviet Paper Trust. Buhrmann, and the manufacturers of the world have long believed in sales agencies maintained in world markets by firms which are technically termed "brokers" by the Soviets. The Soviet principle is to sell from factory to consumer, eliminating all middlemen in the course of a sale. Consequently, if the Soviet idea were to be adopted by all paper mills, the famous firm in Netherlands would soon be eliminated. This is a principle which may succeed by the Soviet mills since they are a government monopoly, but it is doubtful whether other world-wide manufacturers could afford to maintain offices or create a system such as that built by Buhrmann, Limited.

Old Russia formerly consumed the bulk of Finland's paper output, but due to wars, new boundary lines and various international elements, forced The Soviet Republic to consider developing its own paper industry. Timber surveys proved conclusively that Russia could supply an endless amount of paper; that foreign trade in this article could be counted upon as a vast source of income; that more than sufficient waterpower was available; and that cheap labor under skilful supervision could make the Soviet mills a power with which to be reckoned.

1930 brings to the paper manufacturing world the fact that the mills of the Soviet Republic, based upon and backed by the largest timber resources in the entire world, equipped with the most modern machinery obtainable, and fortified with a very low labor cost, can threaten the life of the paper mills of all other countries. Still, on the other hand, at least for the few years until the Soviet mills become efficient and their marketing organizations not top-heavy, their production may merely create a still

greater demand for paper at home and throughout Asia so that other mills in various countries will reap a certain amount of the harvest.

The low production costs in Soviet mechanical and chemical pulp is a gain to other manufacturers who consume this product, and through its importation by other mills the forests of their own countries can be conserved.

There are two billion acres of virgin forests behind the development and expansion of the Soviet paper and pulp industry; and behind this is the financial side of the Soviet Industrial System. This is a somewhat difficult combination for other paper manufacturers to meet — except for one thing — that of marketing the finished product—and direct to the consumer. The fact that the Soviets are still importing paper is taken by many to mean that their own mills will not be able to supply foreign trade. While the consumption of paper is increasing rapidly within the Soviet Republics, the construction of new mills is steadily progressing. Just as soon as the saturation point in home markets has been reached, the Soviet mills will become a powerful competitor in world markets. This, the Supreme Economic Council hopes to attain by 1933 or before.

The world's greatest potential consumer market for paper in the future lies in Asia, and with the development of educational systems, the adoption of many modernisms, the demand for paper will grow in proportion. The Soviets are in a position through rapidly expanding transportation lines, with enormous resources in timber and mill production, and low prices at destination, to corner a large share of this trade. The sales results obtained by Buhrmann, Limited, over the past years has demonstrated that markets can be created in every corner of the world, but the question of 1930 to 1933 and beyond is whether those markets can be held in the face of aggressive Soviet competition. Transportation costs are a vital element in the sale of paper, and the mills of America and Europe will have some difficulty in meeting this point, not to mention that of cheap labor, cheap power, and cheap basic materials.

At the end of the War, the paper industry in Russia had become nil; by 1921 there were ten mills in operation; and at the end of 1929 this had increased to nearly one hundred mills. These mills, combined with the new and modernized mills of Japan and China, truly present a formidable front in production and as a competitor. Nor will their combined output be consumed entirely at home at first. One of the first elements is that of creating a demand in the Asiatic markets, and while this is being done, the markets of the remainder of the world must be entered and sold to dispose of surplus outputs. Patriotism to home industry is a very efficient cry at times, but close investigation in numerous world markets has proven to Buhrmann, Limited, and other marketing agencies that buyers will buy where they can buy cheapest providing quality is nearly equal.

Consequently, the paper manufacturers of any country must cease to regard home markets as their particular field of endeavor, and international markets must be substituted. To do this the elements of raw materials and labor costs are of vital importance. Italy learned that forests had to be developed to supplant imported pulps, but that theory has now been upset through the possibility of importing their pulps from other countries at such prices, combined with their labor costs, so that their four hundred mills can continue to operate. World markets for paper should become the study of every manufacturer; and world competition both of the present and future should be the cynosure for paper manufacturers' research and marketing experts. From Kondopozh on Lake Onego in the Soviet Republic to the mills of North America there is now only one prime question—"How much paper can the world consume, and how much production can the present mills of the world turn out each year to meet that ever-growing demand?"

When we stop to consider that the vast bulk of the world's peoples are only meagre consumers of paper and paper products, and that the present and planned world production would not meet the demand were it equal all over the world, there seems to be sufficient business for all paper manufacturers. However, at present such is not the case, and the secret of increased paper sales for the next few years will come through such efforts as those of Buhrmann, Limited, but by and through the collective efforts of the manufacturers to create the demand in markets that are potential, to secure such footholds in foreign markets, that when the new mills of the Soviets, Japan, and China, with their lower production costs, are ready, that the business of the other mills of the world will not be throttled because of a lack of markets.

The Central Paper Trust of the Soviet Republics is one of the major industrial units in their scheme of things from which they plan to gain international revenues. Some manufacturers are trying to make themselves believe that the Soviet industry will never become a keen competitor, but it is safe to assume, on the basis of their strides since the revolution that they will stop at nothing short of near perfection. And near perfection to Soviet paper mills means that outputs must be sold. Millions of dollars are being spent to create a dependable paper producing unit in Russia, and a survey of the Five Year Plan in detail is conclusive evidence that they fully intend to make the paper unit one of the most productive and profitable in the Republic.

Nor are the paper manufacturers of Finland, Sweden, Norway, Poland, Germany, Great Britain,

Austria, and various others satisfied to settle back to watch their newer competitor in the Soviets, wrest hard-earned markets away. The mills of those countries are constantly developing greater foreign markets, they are sending forth missionaries to all corners to discover and educate and create paper consumers. Paper has become an international subject of prime importance and not the exclusive product of one or a few nations. The future holds forth two prospects for the paper manufacturers to consider: (1) independent marketing of individual outputs; (2) collective marketing of mills marketing specific products of similar or like types to meet competition from such mills which can produce so cheaply that those of other countries cannot exist. Buhrmann, Limited, is an outstanding example of an efficient paper marketing organization which can become a centralized distribution unit for the manufacturers of every country to compete with the "mill to consumer" sales plan; or the manufacturers in North America can create their own distribution agencies in the potentially great markets of the Orient where paper and paper products are destined to become one of the greatest items of trade in the next ten years.

Lessons in Steam Plant Practice

Lesson II—Steam Generators

By J. CHARLES RYDER
Champion Fibre Company, Canton, N. C.

These lessons in Steam Plant Practice are being published in THE PAPER INDUSTRY by arrangement with the Champion Fibre Company, Canton, N. C. They are a part of the general educational course conducted by this company under the direction of J. Norman Spawn, educational director.

WE went into the history of STEAM in our previous lesson, and in this lesson we will take up the steam generators.

Professor Thurston in his "Manual of the Steam Boiler" says, "The requisites of good boiler design are readily prescribed and defined; they are very simple, and although attempts are almost daily made to obtain improved results by varying the design and arrangment of the heating surfaces, the best boiler of all makers of acknowledged standing, are practically equal in merit, although of diverse forms."

In making boilers the effort of the engineer should be:

1—To secure complete combustion of the fuel without permitting dilution of the products of combustion with excess air.

2—To secure as high furnace temperatures as possible.

3—To so arrange the heating surfaces that, without checking draught, the available heat shall be most completely taken up and utilized.

4—To make the form of boiler such that it shall be constructed without mechanical difficulty or excessive expense.

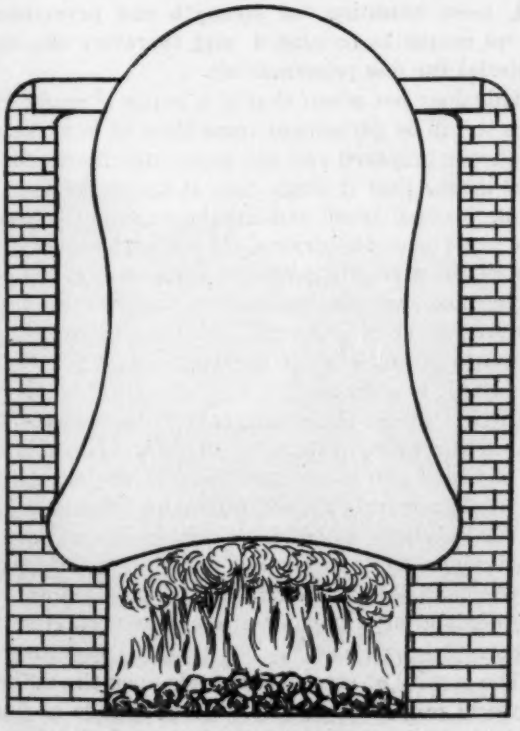


Fig. 5—Watts Wagon Boiler

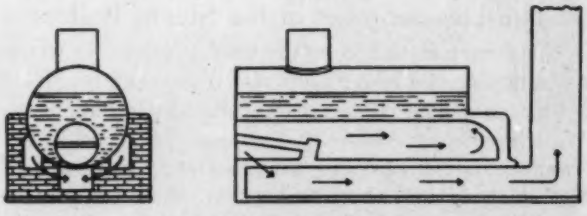


Fig. 6—Cornish Boiler

5—To give it such form that it shall be durable, under the action of hot gases and of the corroding elements of the atmosphere.

6—To make every part accessible to cleaning and repairs.

7—To make every part as nearly as possible uni-

form in strength, and in liability to loss by wear and tear, so that the boiler when old shall not be rendered useless by local defects.

8—To adopt a reasonably high "Factor of Safety" in proportioning.

9—To provide efficient safety valves, steam gauges and other appurtenances.

10—To secure intelligent and very careful management.

Professor Thurston considers both boiler and furnace together and he mentions the requisites of the furnace first, as being of greatest importance. In all internally fired boilers such as the Scotch marine, and locomotive fire box boiler, the furnaces are embodied in the same construction. The tendency for stationary boilers was to get away from this form of construction and now we are coming back to it in the form of water walls, ash screen, and arch. However, the problem of fuel combustion is separate from that of steam generation and while it takes both to make steam we must separate their problems.

The heat of the fuel is released in the boiler furnace and reaches the heating surfaces of the boiler in two ways:

First, as radiant heat, the heat rays traveling in direct lines from the burning fuel and from the reflecting surfaces of the furnace walls to the exposed parts of the boiler.

Second, as sensible heat riding upon the carrier gases of combustion from the furnace to the heating surfaces of the boiler.

Heat reaches the water in the boiler by conduction through the metal heating surfaces and is then distributed by convection throughout the mass of water in the boiler. Convection depends upon the circulation of the water in the boiler and rapid circulation is a requisite of rapid and efficient steaming. All the steps that have been taken toward the improvement of boiler efficiency have been in the direction of improving the arrangement of the heating surfaces and increasing the circulation.

The Development of the Steam Boiler

Newcomen seems to be the first to realize that the efficiency of the boiler as a steam generator was, in a way, proportional to its exposed heating surfaces. Watt was impressed with the same idea and in his "wagon" boiler (Fig. 5) provided for the return of the gases from the combustion chamber at the rear through flues at the sides of the boiler. He named the boiler on account of its resemblance to the body and top of a covered wagon.

The Cornish boiler (Fig. 6) was the next advance in boiler construction. It was a cylindrical boiler giving maximum strength to resist internal pressures, and had one large return flue to give increased heating surface. It was internally fired, the gases passing from the front through the flue, dividing and returning along the sides to the front, passing back beneath to the uptake. The flue was about one-half the diameter of the boiler, and the grate was in the flue.

Steam Plant Practice Questions

Lesson No. 2

(1) What do you understand is meant by "complete combustion"?

(2) What is the best way to secure a high furnace temperature?

(3) State how the heating surface can be changed to absorb more heat after the boiler has been installed and operated, and not change the boiler design.

(4) What is meant by Factor of Safety?

(5) Why is a locomotive boiler called internally fired?

(6) How does the heat of the fuel reach the heating surface of the boiler?

(7) How does the heat reach the water in the boiler?

(8) Upon what does convection depend?

(9) What was the path of the gases in Watt's boiler?

(10) State two things necessary to the efficient absorption of heat by a steam boiler.

Permanence and Papermaking

Nos. 2, 3 and 4

By DR. TH. BENTZEN

Chief Chemist, Whiting Plover Paper Co., Stevens Point, Wis.

RAGS as paper material has, before all, the foremost condition for strength and permanence, by no means to be eluded, and therefore the main material for fine papermaking.

This does not mean that if a paper is made from rags it will be permanent regardless of how the rag stock was prepared and the paper manufactured. It only means that if every care is taken through the whole process from cooking the rags until passing the paper over the dryers, then a paper made from rag will be perfectly permanent and strong, and even if the same care was taken with any other material, it would never be its equal. Even the most fanatical advocate of any kind of substitute must admit this, because it is a fact.

In the papermakers' language, "rag" means only cotton and linen, at least as far as fine paper is concerned, and the most important of the substitutes to be considered is the conifers-sulphite pulp, as this is the only one which to a certain extent may be used where the papermaker is forced to offer some of the qualities of strength and permanence to meet the demand of a cheaper grade of nevertheless fine paper.

The quality of strength depends upon the differing physical properties of the different kinds of fibers, whereas the permanence is due to their chemical

composition, and although this chapter is headed "strength and permanence," I shall prefer in this chapter (to avoid unnecessary repetitions) only to talk about the conditions of strength, and in chapter five, where we shall hear about the chemical pulp, we shall then investigate the question of permanence.

It is evident that the longer a fiber is in proportion to its thickness, the more flexible it will be, and the more capable it also will be to bend and to twist in forming a strong combined entanglement (formation).

With help of the microscope and a filar micrometer we are able to state the following facts:

Linen fibers have a length of 25 to 30 mm., the average being therefore 27.5 mm., and Wilhelm Herzberg has stated that from 20,000 measurings the length even ranges between 4 and 70 mm. which would give an average of 37 mm. The following table shows the proportions of the three different main divisions of fibers used for fine papermaking.

	Length	Average Length	Diameter
Linen	25-30 mm.	27.5 mm.	0.0141 mm.
Cotton	12-40 mm.	26 mm.	0.0164 mm.
Sulphite pulp	1-4.5 mm.	2.75 mm.	0.0350 mm.

The proportions between length and thickness are according to this as follows:

Linen	1900.0 : 1
Cotton	1600.0 : 1
Sulphite Pulp	78.5 : 1

The conclusion to be drawn from these figures is in strict accordance with the facts that linen and cotton fibers have the quality of elasticity and strength to a large extent, whereas the sulphite pulp is far behind, and therefore paper made out of rag will, with respect to strength and folding endurance, considerably surpass that only made of chemical pulp.

If we take another look through the microscope, we will notice that the ends of the rag fibers are long-fringed, cleaved or split, whereas the sulphite pulp looks like short broken wood sticks. Therefore, even if we could imagine that rag fibers would be as short and thick as the sulphite pulp fibers, or vice versa, the fringed ends would nevertheless cause the rag fibers to entangle into a close and strong formation, whereas the straight sulphite pulp fibers would fall together beside one another without any mutual connection.

Furthermore, we will notice through the microscope, that the sulphite pulp is covered with countless spots or dots and crack-openings which, of course, weaken the fibers. It is therefore altogether easy to understand why paper made from rag is strong and resistant to tearing and folding, whereas paper made from chemical pulp is more or less brittle.

(3) The different grades of rag is the cause of the difference in strength of papers, but does not have any influence upon its permanence.

It is, of course, a matter of fact that new rags, as far as they were not spoiled beforehand through the washing and bleaching processes in the textile mills, will give a stronger paper, than old worn out, soiled

(Continued on page 285)

THE LITTLE KNOWN COUNTRY OF ESTHONIA

Esthonia lies adjacent to the Gulf of Finland in that historic country which was part of Russia and now is an independent country. The Capital city is Reval. Photo shows the Rapina Paper Mill where the paper currency for Esthonia is made

Current Thought by William Sibley

Getting Back to Fundamentals

WRITING in this place two months ago I opened my remarks with the quotation and statement: "'My days are as swift as a weaver's shuttle' was the lament of one eighteenth century bard."

Not long after its publication, Mr. I. W. McLeod, Administrator of Trade Practice Rules for the Paperboard, Container and Folding Box Industries at 608 South Dearborn Street, Chicago, sent me a much appreciated correction of my credit line. He stated that had I said "eighteenth century B.C." I would probably be closer to the truth, at least closer than I am now, for, as he capably pointed out, the quotation is rightfully one of Job, appearing in the Seventh Chapter and Sixth Verse.

Straight off, I want to thank Mr. McLeod for setting me right on the authorship of the quotation.

Mr. McLeod then continues with: "This letter is written in a most friendly spirit without desire whatever to be captious, but just to give credit where credit is due,—particularly in a day and age when so much effort is expended to rob this old book (Bible) of many of its prerogatives."

Perhaps this is right. Certainly we know that the advocates of Communism the world over (including our own country) are doing everything in their power to undermine religion and establish atheism. But I believe signs are not wanting which indicate a gradual return to basic fundamentals. We are just now getting over the war and its past was a period of cynicism. We are just now entering upon an era of Belief and Faith, Romance and Modesty which will one day make us ashamed of the "twenties."

One of the foremost indications of our gradual return to fundamentals may be found in this very thing Mr. McLeod says is suffering—the Bible and its teachings. For sometime—more particularly since the war—it has been the commonly heard boast that "Oh, we don't go to church any more. Haven't been to church since last Easter." Such boasts are less frequently heard now. For the greater part, these "boasts" have become half-hesitant admissions. Not only is there a widespread interest in Humanism and the establishment of scores of Humanist churches, but there is a noticeable effort on the part of theologians to alter the church to satisfy the discriminating tastes of the unchurched. Also, there is grateful acceptance of Mr. Lippman's "Preface to Morals" and an equally gratifying decline for psychologies and analyisms. I may be greatly mistaken but I believe that in another ten years we will be as close to church and the Bible as we were far away from it ten years ago.

Why? Because we have become surfeited with the doctrine of debunking. We have been debunked by experts until now the revolt is setting in.

We poured love and admiration unrestricted on Lindbergh, not so much because he excited our gambling instinct with his daring and our regard because he kept his head and acted like a gentleman, but because we were starved to death for a hero. All our old and beloved heroes—Washington, Jefferson, Hamilton, Marshall, Lincoln, etc., had been "debunked." We were not permitted to worship the time honored men who we had been wont to deify because one after another debunker had found warts on the noses of our heroes and had magnified those warts all out of proportion to their proper values under the guise of "humanizing" the subject. We had had so much of debunkers that we no longer had heroes to worship and human-kind, whether here or abroad, **must** have heroes. Hence our eagerness to claim Lindbergh, and Byrd, and Helen Wills, and such other outstanding characters. To my mind this is an indication that our recent era of cynicism is approaching an end and that we are effecting a return to the fundamental of idealism.

Further evidence of this trend may be found in our treatment of Ramsay MacDonald when he paid us his recent visit. While here the British Prime Minister dealt most largely in international behaviorism and in idealisms. We welcomed him. We drank in his words—absorbed and digested them. And sought after more because not since the days of Wilson had such idealism been expressed. We had had none of it for twelve years and we all at once

discovered we were hungry for it. We, as a nation, have begun to traffic in ideals again.

Do you remember—back in the days immediately following the war—the uncounted articles and editorials written around the idea of "more business in government and less government in business?" I, myself, contributed my small quota to the pile, as an editorial writer on a New York daily and a feature writer for magazines. There was sense to it all, of course. It was much needed at the time. But did you notice the almost complete absence of any mention of "less government in business" when Hoover called his committees and took a hand in the affairs of business after the crash of Wall Street?

Business, with a capital "B", turned eagerly to Washington for help when its executives and office boys alike found it as easy to get poor quick as it was to get rich quick. Little by little and in one way after another we're getting back to fundamentals.

There are countless other, minor indications that we are shedding our past war cynicism and getting back to pre-war fundamentals.

For a dozen years or more the language of our theatres has become more and more vulgar and brutal. The frankness of ten years ago sunk to the profanity and obscenity of two years ago. And we revolted—to the extent that today we become wistfully tearful over "Sweet Adeline," "Sherlock Holmes" or the Herbert operas, then pay high tribute to that splendid play "Journey's End"—largely because it depicts soldiers as gentlemen and not muckers and is singularly free from profanity or even "heavy" slang. "The Front Page," "What Price Glory" and other profane and suggestive plays are being replaced by others of a historical character or built in such a way as to be clean rather than dirty.

Our conversation, among mixed groups, is much cleaner than it was five or ten years ago. For years we have been talking and writing, frankly and freely, about sex and sex matters. We have continued this until the subject of sex, even among mixed company, is an old story. And how quickly we tire of old stories!

Our literature, little by little, is becoming cleaner. Murders, gang wars, sex scandals, no longer carry the old thrill and find less frequently the old prominent place in newspaper headliners. We are discovering more new planets and antarctic continents than college debacles or strip poker parties among the "elite." We are paying more attention to the rapid developments of science and the breaking of speed records by machines than we are to the antics of a wealthy drunkard or the publicity-seeking statement by some half-baked "authority." Skirts are growing longer and drinking less of a "smart" thing to do. Fewer quotations of Mencken and more of the doings of the Rotarians are being published in our periodicals. Sentiment, romance, idealism, modesty are gradually asserting themselves over the cynicism, skepticism and sophistication of yesterday.

By this I do not mean that we shall witness a return to the "Mauve Decade." I mean only that every major war in history has had as its aftermath a period of cynicism and superficial thinking—and that this war's period is coming to an end. My evidence, I realize, proves nothing conclusively. I merely set down these things which are to me random indications of our gradual return to basic fundamentals.

* * * *

Next Month

"Current Thought" for the month of June will devote itself to a recitation of some of the more recent developments in the fields of engineering and science. We commend the article to your early and serious attention.

At no time in history has the tempo of life been so rapid. The speed with which we are pulling down, then rebuilding to ever more costly heights, seemingly is approaching the hysterical. Yet, in the midst of all our rapid development—in the face of overnight changes more far reaching than the decade changes of a past generation—there still remains ultra-conservation and slow-mindedness which is more costly than wrong-headed haste.

So gripping is the hold of science and engineering on our whole life structure that to ignore the trend, to close one's eyes to developments, to blind one's self to the importance of new things, to continue in the belief that "my business is different," to fail in the realization that today no industry is "extraneous" to ours is to court commercial disaster.

Never before in all history have we stood in greater need of inter-industrial knowledge. At no previous time has knowledge of what the other man is doing been more imperative.

In THE PAPER INDUSTRY, where we are limited to two small pages, we cannot hope to more than catalogue the changes which have and are taking place. Even this brief tabulation, however, is important to the executive with vision and we offer for your anticipation Mr. Sibley's article in next month's "Current Thought."

Permanence and Papermaking

(Continued from page 283)

through oil, grease and vigorously washed. But as we shall see later, the grade of rags has no direct influence upon the permanence, "the ability to resist the influence of natural conditions."

(4) Grading of rags.

In the different handbooks for papermakers, the grades of rags are specificated and instead of reprinting these general and special classifications, I shall only refer to E. Sutermeister's Chemistry of Pulp and Paper Making, and to Volume IV of The Manufacture of Pulp and Paper. But as "practice goes before theory" I shall advise the practical papermaker to do his own grading with help of the laboratory beater and the sheet mold.

Airplane view of Admiralty Island, Tongass National Forest, Alaska

Alaskan Sources of Pulpwood

THE introduction in the United States Senate of a resolution resolution requesting the Secretaries of Interior and Commerce to furnish all available information concerning the supply of pulpwood in Alaska has served to direct attention anew to the possibilities of Alaska as an independent American source of pulp and paper. Wood adapted to the manufacture of sulphite pulp for use in the production of newsprint paper was stated in the resolution to be available in Alaska in large quantities and its utilization by American manufacturers was earnestly advocated. It is said that surveys for two pulp and paper plants in the southeastern part of Alaska have been started, but well informed foresters connected with the American Paper and Pulp Association and the News Print Service Bureau aver that in view of the overproduced condition of the industry and in view of the low costs of manufacture in more accessible regions in the United States and Canada, the time has not yet come economically for any such development. As D. C. Everest, former president of the American Paper and Pulp Association, said in his address on "Regional Shifts in Papermaking," at this year's meeting of the association, "Such development at this time is unwarranted and unsound. It merely means a new regional development which cannot compete in the higher grades of pulp or paper either with the West Coast or the South in the United States, or with the Canadian development in newsprint. There is no economic necessity for Alaskan development, nor is there any economic advantage in locating a plant there at this time."

It was reported three years ago that a sale of 8,350,000 cords of pulpwood had been awarded to I. and J. D. Zellerbach, of San Francisco, but this award was conditional upon waterpower permits from the Federal Waterpower Commission. At the same time George T. Cameron, of San Francisco, and associated publishers, had a similar bid of 8,350,000 cords accepted on the same conditions. The Zellerbach development was to be located in the vicinity of Ketchikan, and the Cameron development at Juneau, the capital of Alaska, 240 miles north of Ketchikan.

According to a statement made in 1929 by the Forest Service, a gradual expansion of the paper manufacturing industry may be expected in southeastern Alaska, "until a total annual production is reached of about 1,000,000 tons of newsprint, or its equivalent, in all forms of pulp products," which is a lower estimate than that made by Major-General A. W. Greeley in his **Handbook of Alaska** (Charles Scribner's Sons, New York, 1925), who stated that Forest Service studies indicated a production of 2,000,000 cords of pulpwood annually, which, if converted into newsprint, would represent an annual production of 1,500,000 tons, or more than half of the present yearly requirement of the United States.

According to General Greeley, the power sites investigated by the Forest Service and the Federal Power Commission in 1921 and 1922 occur in units suitable for a wide range of pulp mill capacity, the largest site being able to furnish 32,000 horsepower throughout the year. In reference to the management of the timber resources of the national forests of Alaska, it is declared by General Greeley that the prime objective of the Forest Service is the development and maintenance of a permanent pulp and paper manufacturing industry commensurate with the available waterpower and timber resources.

Left—Pulp mill of the Alaska Pulp and Paper Co., Port Snettisham on Tease Lake power site, Tongass National Forest

Right—Mixed forest of Sitka spruce and western hemlock. Sound straight trees of good height, Tongass National Forest

Left—Mixed second growth of spruce and hemlock, Tongass National Forest

Below—Mendenhall glacier—one-quarter mile from Juneau, Alaska

The Paper Industry 1930 Safety Contest

January-February-March Scores (Cumulative)

18 Mills Finish First Half

PERFECT SCORES

	ENTRANT	MILL	LOCATION
Group A	Kimberly-Clark Corp.	Badger-Globe	Neenah, Wis.
	International Paper Co.	Port Edward No. 2	Port Edward, N. Y.
	Anglo-Canadian P. & P. Mills	Limoilou	P. Q., Canada
Group B	Finch Pruyn & Co., Inc.	Glen Falls	New York
	The Crystal Tissue Co.	Middletown	Ohio
Group C	Port Huron Sulphite & Paper Co.	No. 1	Port Huron, Mich.
	Marinette & Menominee Paper Co.	Menominee	Michigan
	Sorg-Oglesby-Smith Paper Co.	Oglesby	Middletown, Ohio
	International Paper Co.	Webster	Orono, Me.
	Bird & Son, Inc.	Phillipsdale	Rhode Island
	The Upson Co.	Lockport	New York
	International Paper Co.	Livermore	Maine
	International Paper Co.	Winnipesaukee	Franklin, N. H.
	Union Bag & Paper Corp.	Allen	Hudson Falls, N. Y.
	United States Gypsum Co.	North Kansas City	Missouri
	International Paper Co.	Riley	Maine
	United States Gypsum Co.	Gypsum	Ohio
	Continental Paper & Bag Corp.	Greenwich	New York

IMPERFECT SCORES

GROUP A				GROUP B				GROUP C			
		Points				Points				Points	
KEY	Rank	Credit	Debit	KEY	Rank	Credit	Debit	KEY	Rank	Credit	Debit
A-16	4	550.920		B-35	3	529.740		C-27	14	347.280	
A-19	5	538.180		B-23	4	519.560		C-26	15	339.340	
A- 5	6	501.780		B-27	5	512.520		C-11	16	312.700	
A- 7	7	483.340		B-17	6	508.800		C-25	17	234.820	
A-10	8	470.600		B-15	7	507.760		C- 9	18	186.820	
A-12	9	409.360		B-32	8	481.980		C-14	19	175.020	
A- 2	10	394.100		B- 4	9	466.840		C-12	20	163.000	
A-26	11	383.540		B- 3	10	421.480		C- 5	21	89.880	
A-15	12	372.260		B-39	11	410.940		C-30	22	79.020	
A-30	13	357.860		B-41	12	362.460		C- 2	23	30.780	
A-25	14	342.520		B-30	13	315.620		C-33	24		78.080
A- 6	15	335.400		B-33	14	287.220		C-41	25		103.000
A-21	16	332.780		B-28	15	166.380		C-29	26		200.360
A-38	17	239.040		B-29	16	155.500		C-17	27		338.020
A-34	18	208.160		B-25	17	99.520		C-24	28		441.780
A- 1	19	187.380		B-19	18	68.780		C-16	29		499.940
A-22	20	87.560		B-10	19	59.660		C-45	30		665.480
A-20	21	81.540		B-26	20	19.320		C-15	31		727.980
A-13	22	21.520		B-31	21	0.980		C-22	32		731.800
A-31	23	8.140		B-15	22		28.561	C-19	33		773.620
A-28	24	1.700		B-14	23		50.120	C-20	34		1101.760
A-14	25		13.040	B- 1	24		76.120	C-24	35		1239.660
A-11	26		18.620	B-12	25		142.860	C-21	36		1279.480
A-29	27		354.660	B-24	26		210.600	C- 8	37		1437.040
A- 4	28		505.280	B- 5	27		210.840	C- 7	38		1749.000
A- 3	29		539.300	B- 9	28		270.600	C- 3	39		1808.920
A-24	30			B-11	29		743.700	C-37	40		3240.560
A- 9	31			B-38	30		803.480	C-18	41		4771.780
				B-16	31		888.340				
				B- 6	32		933.600				
				B-40	33		1120.540				
				B- 2	34		1161.800				
				C- 1	35		1999.580				
				B-34	36		2004.320				

Reports not received: A-18, A-32, B-7, B-13, B-36, B-42, C-6, C-10, C-38 and C-46.
Closed down, C-46.

Contest Winner Enters Fifth Safe Year

The News Letter announces that the Riley, Maine mill of the International Paper Company is entering its fifth year of unbroken safety performance.

It will be recalled that this organization won the 1927 Group C trophy in The Paper Industry Safety Contest, after contesting with other mills in that group for a period of twenty-seven months. In view of this outstanding performance, it was also awarded the major trophy in the 1927 contest.

The Use of Kollergangs in Europe

The Paper Division of the U. S. Department of Commerce has published in the April 12th issue of "Side Runs of the Paper Trade" an interesting account of the use of Kollergangs in European paper mills. The Kollergang is a familiar sight in the paper mills of Europe, although it is practically unknown in the United States and Canada. The reason for its popularity in Europe seems to be as auxiliary equipment in the ordinary paper mill, and as a rather valuable adjunct in the manufacture of kraft paper.

Instead of putting broke and waste paper directly into the beater, it is first treated in the Kollergang so that the time required for beating is reduced. Kollergangs are also used for screenings in combined pulp and paper mills. All of the uncooked particles are given a thorough treatment and then returned to the screens the second time; in fact, the operation may be repeated several times, so that eventually only the knots remain. The other fibers are perhaps not fit for the better grades of paper, but do very well for second grade wrappings, especially heavy mill wrappings.

In five machine newsprint mills in Sweden screenings treated in Kollergangs furnish sufficient raw material to run a Yankee machine on heavy mill wrappers, so that outside supplies of wrapping paper need not be purchased. In the manufacture of kraft paper the Kollergang performs another function, in that it reduces the time necessary for the beating, and at the same time has little, if any, influence on the strength of the paper made. Paper made from pulp treated in Kollergangs is of very close formation as a rule. It cannot be used for purposes that require more porous paper, as for instance for cement sacks. The Kollergang seems to eliminate the necessity of using jordans in kraft paper mills at a considerable saving in power. A modern Norwegian kraft mill is using 75 hp. per 1,000 tons of paper produced per annum, which is said to be exceptionally low compared with American requirements. Rod mills are being investigated in the Scandinavian countries, but it is doubtful whether they will ever be as popular as Kollergangs. So far there seems to be considerable skepticism about their merits. (Commercial Attache Marquard H. Lund, Oslo.)

N. S. C. 1931 Safety Calendar

The yearly calendars distributed by the National Safety Council have met with a growing demand and appreciation, but the 1931 calendar just completed, is indeed a masterpiece, representing months of concentrated and intensive effort to create something better. The Council proudly claims for this calendar, the finest it has yet produced.

Each of the twelve months carries a reproduction of a beautiful paintings in colors, and each painting represents one of the industries affiliated with the National Safety Council. These reproductions were made from actual paintings done by skilled artists and each is a prize. The paper industry is fittingly typified by a magnificent paper machine in colors. This recognition of safety in the industry enhances the value of the calendar as an aid in safety education among the mills, and offers a daily reminder of timely information based on seasonable hazards.

There is no increase in price for this "super-calendar" and on orders placed now there is a discount of 3 per cent, payment December 1. Orders and requests for information should be addressed to the National Safety Council, 20 North Wacker Drive, Chicago.

Message to Superintendents About Eleventh Annual Convention

From J. BERTWELL WHITE
General Chairman, Yorklyn, Delaware

FELLOW Superintendents: It won't be long now. The opening of the Eleventh Annual Convention of the American Pulp and Paper Mill Superintendents' Association will be Thursday, May 29th.

Under the present conditions throughout the industry it is a matter of good sound business judgment for every paper mill in the country to have its superintendent present at the Philadelphia meeting. The gain that every superintendent and his company will get out of this convention will many times repay the small investment to cover the trip. Every paper mill officer should insist that his various superintendents and key men attend.

This is a period of co-operation. It is not possible for any one mill, or its employees, to know everything about their business, so these meetings and the rubbing of shoulders with other thinking men in the same line of work, cannot help but be highly beneficial.

If we are to continue to grow we all need to get together once in awhile to get new inspiration, to acquire fresh up-to-date knowledge, get new ideas and definite information on processes and equipment. Too, we gain by sharing our knowledge and experiences with each other. The more we give the more we get.

We need to build ourselves up if we expect to help build up our companies. It's the easiest thing in the world to get in a mental rut. The quality and quantity of our information determines the quality and quantity of our thinking, our thinking determines our decisions, our decisions determine our actions, and our actions determine our destinies. Therefore, it is a matter of self-preservation to want to learn something new and profitable, in order to make yourself a better man for your company and for the Industry as a whole.

Each of us has a certain amount of pride in keeping ourselves and our mill up to date. Too, our loyalty and co-operation in helping to build up the service rendering power of our association are strong reasons why superintendents and officers should attend this convention.

You will get much more accurate information on the latest improved methods and equipment for pulp and papermaking in three days at this convention than you could possibly acquire in a year of individual effort. Superintendents are sure to acquire new and valuable information.

Many interesting papers will be read. You will, in a few hours, receive valuable information that you could not otherwise obtain, or probably never would get.

We have the best of authorities on all branches of pulp and papermaking to read papers, but after all it is up to the superintendents themselves to be on hand to hear these papers and to get up and express their opinions or to relate their experiences in connection with the various subjects under discussion.

Interesting papers are to be read on a variety of pulp and papermaking subjects. Improved methods and equipment will be discussed. You will have three days and nights of highly interesting and instructive experiences. With knowledge comes wisdom, and the power of leadership. If you go home and apply all the knowledge you will absorb at this convention, the results will be gainful beyond your wildest expectations.

Everything is in readiness for the reception of delegations of superintendents and their friends who will come to Philadelphia to attend the convention. We have arranged a well balanced program, one that will afford even the best equipped of papermakers additional knowledge on the modern trend in pulp and papermaking.

Privileges have been secured for visitations to several paper mills and paper mill machinery builders in Philadelphia and Camden. Also, visitation to duPont's great experimental laboratory at Carney's Point, New Jersey.

While the major part of the time of the convention will be devoted to the serious sides of our work, our program also includes the right proportion of entertainment to keep the delegates in good humor throughout the convention.

Every one of our sub-committees is prepared to do its part for the enlightenment, entertainment, convenience and comform of the visiting superintendents. Philadelphia is particularly noted for its hospitality and I am confident that every visitor will take away lasting memories of a pleasant trip.

I strongly urge you to bring your wives with you. Mrs. James G. Ramsey and her entertainment committee have arranged a delightful program for the ladies. There will be a sight-seeing visit in special automobiles to the historic battle grounds and Washington's headquarters at Valley Forge Park. Luncheon will be served at the famous Valley Forge Hotel. And don't forget that wonderful boat trip down the Delaware River. Too, the ladies are invited to participate in all of the other delightful features of the convention.

I urge you in order to prevent delay and inconvenience in obtaining accommodations on arrival to send your reservations to me as early as possible. We have ample hotel accommodations for all, but the sooner we can dispose of the matter of reservations the better we will be able to tackle the other problems involved in the successful execution of all our plans.

It is now up to the superintendents to make the convention complete by their attendance, and to those who have not already done so I wish they would send me their reservations immediately, informing me when they will arrive, how many they will have in their party and the sort of hotel reservations they desire. I will do the rest. Reservations should be addressed to—J. Bertwell White, Yorklyn, Delaware.

Members wishing to play golf, please make application to Mr. Joseph H. Dow, Chairman of the Golf Tournament, address—Eastwood Wire Corporation, Belleville, New Jersey.

All we need now is the co-operation of the superintendents themselves, and I am sure we are going to get it, judging by the number of reservations that I have already received from pulp and paper mill superintendents in all parts of the country.

So please put your mill and your affairs in order now so that nothing can interfere or prevent your trip to Philadelphia, where you will enjoy and profit by attending the biggest and best convention ever held.

The Paperboard Industries Association and Trade Practice Division will meet at the Drake hotel, Chicago, May 20, 21 and 22. The group meetings will be held Wednesday, May 21, with a general session of all groups the morning of the 22nd.

Northern New York Supers Meet

Excellent Discussions Given on Four Highly Important Subjects at Spring Meeting at Syracuse, New York

THE Northern New York Division of the American Pulp and Paper Mill Superintendents Association held their annual spring meeting at Syracuse, N. Y. on Saturday, April 30th, 1930. A very excellent program was arranged by the chairman, Mr. John Brougham of the Foster Box Board Co., Utica, N. Y., president of the division.

Attendance at both morning and afternoon sessions numbered approximately seventy-five. A banquet was given at the Onondaga Hotel in the evening and was attended by over one hundred members of the division. Assemblyman Horace Stone was the principal speaker of the evening.

Registration of those in attendance took place at the Onondaga Hotel and was in charge of the divisional secretary, Mr. Kelly, of Bloomer Bros., Newark, N. Y. Mr. James Ramsey, president of the national association gave a short address of welcome. The remainder of the morning was given over to a round table discussion of various manufacturing problems.

The afternoon meeting was held at the New York State College of Forestry at Syracuse University. An inspection tour through the Pulp and Paper Laboratories was conducted prior to the formal meeting. The delegates were welcomed to the college by Prof. R. R. Fenska acting in behalf of Dean Nelson Brown who was unable to be in attendance.

The Paper Mill Chemist

Professor C. E. Libby of the New York State College of Forestry presented a paper on "The Chemist, an Economic Factor in Paper Making." The duties of the paper mill chemist were classified by Professor Libby in three divisions, namely, plant control, plant research and product research. The work of the chemist in the latter two fields usually results in greater efficiency in the manufacturing process with a resulting decrease in costs and a product of superior quality. Product research affords an excellent opportunity for a mill to build up good will among its larger customers by offering the expert services of their chemist to those customers for a study of their printing and paper requirements. The returns resulting from technical control in the manufacturing process amply repay the mill for the investment involved in the services of their chemist. The value of technical control in the various steps of the process was discussed in some detail by Prof. Libby. Several instances were cited showing the actual savings accomplished through proper evaluation of raw materials entering into the finished sheet. A competent chemist can improve the quality of the paper through proper control in the groundwood or sulphite mill, supplemented by proper supervision in the beating and refining process.

Steam and Power in Paper Production

Frederick C. Stamm of The Upson Company, Lockport, N. Y., next presented a very excellent paper on the subject of "Steam and Power Problems in Paper Production." Mr. Stamm stated that the overproduction and low profits of the last year could be eliminated mainly through a reduction in manufacturing costs. Steam and power represent over forty per cent of the total conversion cost and it is here that the greatest savings can be accomplished. These savings may be obtained by standardizing the power consumption in the beater room as well as the elimination of inefficient and unnecessary pumps. The variance of steam consumption per pound of paper in drying shows that much remains to be done in this field alone. Though the saving per pound of paper in this respect may be slight, the equivalent annual saving is astonishing. Mr. Stamm pointed out the necessity of having a gradual control of temperature in drying as well as good dryer drainage if steam consumption is to be lessened at this point. Gradual temperature control also results in a sheet which is stronger and has less cockles than one which is subjected to high heat at the calender end.

Historical Development of Continuous Beating

J. D. Haskell, engineer of the Dilts Machine Works, Fulton, N. Y., spoke on the subject of "Continuous Beating." Mr. Haskell presented for the first time the historical development of continuous beating and a detailed discussion of present day equipment as used in the manufacture of the coarser grades of paper and board.

"The subject of Continuous Beating is not new," said

Picture taken at spring meeting of Northern New York Division of American Pulp and Paper Mill Superintendents Association, Syracuse, New York, April 26, 1930

Mr. Haskell, "and it is safe to assume that with the advent of machine made papers involving continuous forming machines also came the idea of continuously preparing the stock ahead of the machine. Any industry producing any commodity in large enough quantities is potentially a field for continuous operation.

"However, the main difficulty with continuously beating paper stock," he said, "is to build a machine which will have universal application—a machine which will work on all grades of paper. Such a machine would have to be capable of differentiating between a fiber which has been thoroughly hydrated and one of the same length which has not had proper treatment. So far, no such machine exists and it is difficult to picture. Therefore beating cannot be continuous at all in the strictest sense of the word, and a paper of this kind must necessarily be limited to the coarser grades of paper, and chip and boxboard mills offer the biggest field for this development.

"As early as 1854, J. Lallemond produced peat stock for paper by a continuous mechanical and chemical process which would compare favorably with advanced practise in board mills today," continued Mr. Haskell. "It would appear, however, that a German named Reiman made the first real attempt to continuously beat stock. This was in the early '80's. He took out a patent covering this process which consisted of building the beater hoods with a screening member located in front to receive the stock thrown over by the roll. Troughs were provided for conveying the stock from one hood to the next beater. The specifications of his patent called attention to the fault in batch beating in which some of the fibers, by virtue of their character, more readily lend themselves to reduction more quickly than others. It was the object of Reiman's invention to prevent the "grinding to death" of these softer fibers, as with batch beating it is necessary to keep all of these fibers in the beater until the harder fibers in the whole mass were ready for the machine.

"Reiman equipped several beaters with extractor hoods in series, and when a fiber was finely enough reduced to pass through the screen in the first beater, it was discharged to a second beater which was equipped with a finer screen—and so on. The last beater in the series was provided with a screen fine enough to allow only the properly reduced fibers to pass through and be discharged to the chest. The trouble with this system lay in the fact previously referred to, that the fibers might be fine enough to pass through the screen and still not be properly hydrated. However, Reiman certainly originated the idea of continuously handling stock from one beater to the next which is just lately being tried out in this country.

"At about this same time," said Mr. Haskell, "another German by the name of Friederich patented a beater with a screened member for continuously passing partially reduced stock.

"In this country," he said, "the first development along this line, so far as we have been able to determine, was made by Mr. G. D. Stevens now chief engineer for the Fort Wayne Corrugated Paper Company. This was sometime between 1885 and 1892. Mr. Stevens was then with the Portage Strawboard Company and he noticed that the stock in one of their beaters was oozing out of a crack in the front of the hood, and this stock was ready for the chest. The thought occurred to Mr. Stevens to remove several boards from the front of the hood and place several horizontally disposed rods across the opening. Then by building a trough around these rods and running it to the chest, he was able to produce very good stock and run the beater continuously. This was at the time the Portage mill changed to old paper stock furnish and the beaters with continuous hoods were run for several years in this way. In fact, Mr. Stevens has several beaters equipped with similar hoods at Fort Wayne now.

"Probably the biggest single reason for development of continuous beating on chip and boxboards was the fast diminishing supply of wood pulp timber in this country. This made the raw stock costs prohibitive and made the reworking of old paper stock profitable. Breaker beaters were developed to re-work these old papers, although Allen and Mason patented a breaking engine to do this work as early as 1883.

"We believe credit for the first practical development for reworking old papers, dump stock and the like, belongs to George and Tom Harvey in Middletown, Ohio," Mr. Haskell said. "Tom Harvey patented his system in 1911 and from his idea have come many features incorporated in a more developed state in modern continuous beater systems, such as settling troughs, screens, thickeners, and closed white water systems.

"The Harvey system made use of a rotary for cooking the old paper stock which was dumped into the rotary pit after cooking, and from this point his system in its developed state, could be considered continuous, up to the finishing beaters. The stock from the rotary pit was conveyed continuously to the head box where it was diluted with water, thence to a riffle box for settling out the dirt and heavy particles. From the riffler the stock was passed over a flat screen and the screened stock was suitably reduced for directing to the finishing beaters or jordans after having been properly thickened. The water extracted in the thickening process was returned to the head box of the riffler.

"Also in 1911, Charles Shartle took out his first patent on a system for continuously treating old paper stock. This system also made use of rifflers, screens, thickeners, etc., but in place of the rotary digester, Mr. Shartle used a beater equipped with a bucket arrangement for bailing the stock out of the beater and discharging it into the troughs for dilution. This bucket device had the objection of becoming clogged with string and rags and it was some eight or nine years later before a satisfactory device was developed to take the place of this bucket arrangement in the Shartle breaker beater. This was the Beuhler perforated backfall with which you are all familiar.

"Between 1911 and 1920," continued Mr. Haskell, "many devices for extracting stock from breaker beaters were developed. In 1911, Timothy J. Carroll equipped one of the beaters at the Columbia Boxboard Co. of Mellenville with a hood extractor having vertical slots. He found that the slots became plugged with strings, so he made a cleaning shutter to slide back and forth across the plate to keep it clean. Some four or five years later, Griley and Unkle obtained a patent on a somewhat similar device except that the extractor plate was made with perforated holes instead of slots.

"Charles Rainey built an extractor in the form of a cylinder washer fitted with slots instead of wire. The Bird extractor was somewhat similar, made with perforated covering. Later the Eurich extractor met with considerable success. Sidney Mitchell's hood extractor has also met with success and the capacity very favorable.

"The objection to most of these extractors," said Mr. Haskell, "lay in their tendency to collect rags and strings, which not only caused inconvenience but also cut down the capacity.

"Being builders of beating engines and breaker beaters almost exclusively the Dilts Machine Works were naturally interested in developing this business," said Mr. Haskell, "and sometime ago we obtained a license from the Barrett Companies to use the Howell Bedplate Extractor, patent on which they own. This extractor takes the form of a regular bedplate and box with the top circle part perforated or slotted. It is located under the heater roll so that the sweep of the roll keeps the surface clean and the centrifugal force acting with gravity permits extremely high capacities. It being located in a horizontal position beneath the center line of the roll allows equal pressure over the entire plate so that the whole perforated area is in production."

Mr. Haskell discussed in detail the Howell Bedplate Extractor together with the application of this means of securing continuous beating as applied to mill scale production. Continuous beating in the strict sense of the word is impossible today and will remain so until some device is perfected which will extract only the properly hydrated fibers and still be flexible enough to produce any character

of stuff from a very slow to a very free stock with little mechanical control.

Saving White Water

Michael J. Argy of the Cliff Paper Co., Niagara Falls, N. Y., spoke on "A Practical Method of Saving White Water." Fiber was separated from the white water by allowing it to drain over inclined screens. Although sixty per cent of solid material remained in the white water after screening, no trouble was experienced in the use of this water on all shower pipes in the mill. A marked reduction in steam consumption in drying was noticed as a result of the re-use of this white water. The resulting sheet was more uniformly closed than previously.

Cutting Material Handling Costs

A Record of Experience in the Consolidated Paper Company, Monroe, Mich.

By W. K. LUNT

President, The Sherman Corporation, Engineers

COST of handling material is a factor of such importance in the sum total of manufacturing cost in a paper mill that its reduction becomes a primary subject when the industrial engineer enters into co-operation with many paper manufacturing companies.

Such experience as The Sherman Corporation has accumulated in the paper industry in this connection prompts this conclusion:—

The purchase and installation of equipment for handling material should be preceded by a thorough analysis of the job to be accomplished and the conditions affecting it.

The typical experience summarized in this article will emphasize that fundamental point and may bring out other points of significance.

Consolidated Paper Company, Monroe, Michigan, is the company with whom The Sherman Corporation worked in developing the material handling method in question.

In any use of electric lift trucks, hand lift trucks and platforms as part of a material-handling system, there are certain factors which should govern the selection of equipment. Hand lift trucks will elevate a given load within a few seconds of the time of the electric trucks and will lower the load gently and safely in about the same time. Marked differences in efficiency, therefore, must come in the length of haul, or effort to move the load. There is only a slight time differential in favor of electric trucks, for short hauls and, since the investment in hand lift trucks is only about one-tenth as much as the investment in electric trucks, the reason for

Courtesy—Electric Storage Battery Co.

Electric trucks handling loaded skid platforms

the choice of hand trucks for short hauls becomes obvious.

In the Consolidated Paper Company, all electric trucks are used on hauls of from 400 to 800 feet or longer. Lift trucks are used on short hauls of not over 100 feet. It has proven unprofitable to use this type of truck for the longer hauls. Floors must be smooth and level for lift trucks, for if heavily loaded they require two men to make the pull.

Lift trucks are ideal for loading on narrow docks, and it is not at all uncommon to find narrow docks in older type mills. In order to get the lift truck into a railroad car, the dock must be exactly level with the door entrance and the plates from the cars to the dock must be constructed in such a manner as to fit perfectly. Otherwise, it requires from two to three men to push the truck into the car. Lift trucks cannot be used to advantage in a plant where there are ramps or elevations leading from one building to another, or from one floor to another, or on and off of elevators, unless they are stopped exactly at floor level.

Another example of their shortcomings on certain operations may be found in storing stock on plaforms, for the

Courtesy—Electric Storage Battery Co.

Pulp bales being handled with electric trucks

reason that the stock must be turned around and backed in to the storage platform. Uses of the hand lift truck and the electric truck are so diversified as to require both, in order to facilitate the movement of materials in the most profitable manner.

Analysis of the Consolidated Paper Company's conditions and requirements resulted in the purchase of 9 electric trucks, 4,000 platforms[1] and 18 lift trucks. The expense attached to the operation of these trucks will be written off as follows:—

Electric trucks	3 years	@ 33 per cent
Platforms	10 years	@ 10 per cent
Lift Trucks	5 years	@ 20 per cent

Spare parts will be necessary yearly and must be charged off as expense. It has been estimated that maintenance and power will require a further expenditure of one-twelfth the original cost of the truck and the labor to operate these trucks will amount to about one-fourth the original cost.

[1]The number of platforms, since the original purchase was made, has been increased from 4,000 to over 5,000.

As a result of the installation, savings were apparent from the start as can be seen from the following examples:

In the North Division, where approximately 180 tons per day were handled, the tonnage rate was reduced from an index number of 60 to one of 44.

The stock gangs on Mills 5, 6 and 8 were reorganized. Through the use of electric trucks, costs were reduced from an index number of 195 to one of 150, which saving will approximate $11,500 annually.

In the printing department, through proper planning, the electric truck was utilized full time instead of part time as had been the custom prior to reorganization, thereby eliminating 7 truckers.

Furthermore, it has been estimated that through the installation of electric trucks in the beater room, it will be possible to reduce the tonnage rate substantially.

Courtesy—Electric Storage Battery Co.

Specially designed electric truck for paper rolls

In mills 5, 6 and 8, it has been estimated that by using trucks for handling of all finished boards from the machines, a reduction in labor of about 12 men has been effected.

Here is a concrete illustration of the savings possible through the use of the electric truck as against the hand lift truck:

Loading a car with rolls of paper which approximate 1,000 to 1,500 pounds in weight required four men on one lift truck working 10 hours per day at an index figure of 80. Under the new arrangement, one electric truck with one man loads this car in 3½ hours, with a resulting cost of an index figure of 10 per ton.

It is apparent from the foregoing that before recommendations are made as to the particular type of truck best suited for the many operations in the paper industry, a thorough analysis of all the elements must be made in order to determine which type of truck is most profitable in actual use.

The total net savings for the Consolidated Paper Company as shown in our final analysis amounted to more than double the entire cost of the installation.

The comparative costs of inter-plant transportation for the years 1927 and 1929 shown in the adjoining tabulations are self-explanators. They are given in index figures to avoid disclosing details of actual costs.

COMPARISON COST OF INTER-PLANT TRANSPORTATION

(South Side Division)

	Old Cost Per Ton 1927	Present Cost Per Ton 1929
1. Board from paper machines from Mill 6 to 9	64	10
2. Longnecker Rolls from Mill 8 to Longnecker	150	15
3. Rolls from Mill No. 8 to 6	35	5
4. Board in Sheets from 8 to 9	18	5
5. Board in Sheets from 5 to 9	45	15
6. All rehandled board on floor outbound (All board in sheets was rehandled)	50	none
7. Rolls 35-inch and up, out	70	10
8. Board directly outbound	55	10
9. Flat rate of $1.50 in summer $2.00 in winter paid for unloading		none
10. Receiving Miscellaneous Goods	70	44
11. Supervision	9	0
NO. 9 BOX SHOP		
1. Bundle stock directly out	70	54
2. Unloading bundle goods into stock room (65 per cent was unloaded onto floor)	20	none
3. Picking up bundles on stock floors into trucks or cars outbound	50	none
4. On all goods unloaded into stock in mill other than 9	70	10
5. On all miscellaneous goods shipped or received (now included in item No. 10 mills)	35	none
6. Supervision—Now handled by Mills, item No. 11	6	none
7. Rehandling in No. 9 Box Shop, from Printing to Cutting to Gluers to Tying Department; stock up to cutting and printing	165	29

Rugg Now Heads Westinghouse Engineering and Sales Activities

W. S. Rugg, vice president in charge of engineering, has been placed in charge of sales activities of the Westinghouse Electric & Manufacturing Company, in addition to engineering activities, according to an announcement by F. A. Merrick, president. Mr. Rugg, by this appointment, takes over the activities of Edward D. Kilburn, vice president and general sales manager, who resigned recently and whose resignation was accepted by the board of directors on April 16.

S. M. Kintner, director of the Westinghouse Research Laboratory, has been made assistant vice president, according to Mr. Merrick's announcement, and he assumes engineering department duties under Mr. Rugg's direction.

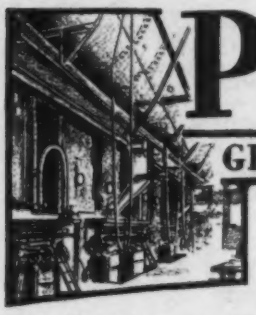
Cutler-Hammer Purchases Union Electric Mfg. Co.

Announcement is made by Cutler-Hammer, Inc., Milwaukee, Wis., that it has purchased the assets of Union Electric Manufacturing Co., also of Milwaukee, manufacturers of Motor Control specializing in a very complete line of drum type control apparatus.

The branch sales offices and warehouse stocks of Union will be consolidated immediately with the Cutler-Hammer branch offices and warehouses. The present factory of Union will be operated as a manufacturing division of Cutler-Hammer. E. F. Le Noir, president of Union, will become a member of the headquarters sales staff of Cutler-Hammer, and most of the Union personnel, will join the C-H organization.

The Turbo-Mixer Corp., New York, manufacturer of agitating and allied equipment announce the appointment of Mr. J. E. Moul as general manager. Mr. Moul's previous connection was that of president and general manager of Gifford-Wood Construction Company, N. Y.

B. Milton Kimball and Roger Q. Pease announce they have resigned as directors of the Nashua River Paper Co., East Pepperell, Mass., to become associated with The Gilman Paper Co. of Gilman, Vt., in full charge of the manufacture and sales of Green Mountain Kraft.



POWER

GENERATION - UTILIZATION - MAINTENANCE

By W. S. JOULE

This section turns the searchlight upon power and its allied problems. It shows up big possibilities to save. Opportunities to improve conditions, methods, apparatus will be discovered. Worth while practices suggest new ideas and wider usages of equipment.

Transformers Deserve a Spring Cleaning

ALTHOUGH transformers have no moving parts and are able to operate longer without attention than any other piece of electrical equipment, properly, they deserve a square deal. It is particularly worth while to give them a close inspection and possibly a careful overhauling in the spring before the arrival of the hot summer months.

All external conditions should be closely inspected to determine the condition of leads, freedom of bushings from cracks and the collection of dirt and other deposits. The case should be gone over to note any injuries which may have occurred, causing leaks. It is very important to check up the level of the oil, for low oil level inevitably means higher operating temperatures. Where possible, it is well to remove the oil and replace it with filtered oil. All oil should be tested, of course, for moisture; and the higher the voltage of the transformers, the more important this is. Where possible, the cores and coils should be removed for examination as to sludging. Sludging interferes with the circulation of oil and the dissipation of heat, tending to bring about a higher average temperature, and a very much higher temperature of the "hot spots."

All leads should be inspected, particularly for any signs of syphoning. Dirty bushings, oil-soaked leads and cracks tend to make thunderstorms more troublesome. Temperatures should be watched, for abnormally high temperatures are a danger signal that may mean anyone of many things. Where practical, it is well to check up the magnetizing current, especially where other transformers have been connected on the same circuit. Core losses higher than normal may result in burned-out transformers, may indicate reverse polarity, short-circuited turns and similar troubles. Where additional transformers are to be installed, it is very important that they have approximately the same relative impedance, otherwise the distribution of loads between the various units may cause a burn-out.

For water-cooled transformers, it is important to test the coils as well as the oil. In many instances, the coils should be cleaned out, so as to remove obstructions and incrustations. The outside as well as the inside of cooling coils should be cleaned, great care being taken that no moisture or acid be allowed to get into the transformer oil. It is well, also, to inspect all fuses and control gear, especially going over the oil circuit breakers. In many instances, fuses corrode, oil-switch tanks collect moisture through breathing sweating or drippings. Higher outdoor temperatures, thunderstorms, rain and dust all combine during the summer months to work havoc with electrical equipment that is not up to par. The time to make everything ship-shape is before the summer months arrive.

The draft gauge is the most important instrument in the boiler room. It is the simplest instrument to use—it is the easiest instrument to understand and the instrument least likely to get out of order. It shows immediately and accurately just what has happened and indicates the cause. Lastly, it is the lowest priced instrument in the boiler room. Every boiler needs a draft gauge for every furnace. And at present prices, no boiler room is too small to find it a good investment.

Steam Separators Still Important

NO engineer would think of operating a reciprocating engine except under exceptional conditions, without a steam separator connected in between the boiler and the engine throttle. The increasing use of steam turbines—and the elimination of the cylinder head explosion hazard and other dangers as the result of water entering the cylinders of reciprocating engines—seems to have created in some quarters a tendency to belittle the steam separator and look upon it as less necessary where the steam turbine is used. It is true that the steam separator is not required with the steam turbine on the score of safety to the extent that exists with the reciprocating engine, since cracked cylinders, blown-out cylinder heads, bent crankshafts, etc., are not involved. Nevertheless, the steam separator is still of the utmost importance—for it is the last-line trench between boilers and prime movers.

Wet steam reaching steam turbines causes attrition and erosion of the blades and buckets. It produces corrosion and often creates a deposit which may not only be corrosive, but which, through gradual accumulation, may be the initial cause of unbalancing. It interferes with the thermodynamic efficiency, of course.

In many steam turbine plants moisture is ignored altogether, the impression being that the installation of the superheater takes care of the problem. Unfortunately, numerous instances show that wet steam still persists and creates troublesome and often costly conditions not only at the turbine but at the superheater valves in the steam lines.

Where priming and foaming occur, moisture and foreign matter are frequently carried over into the superheater. Here they collect, and are later acted upon by the moisture in the steam and the heat. Hydrochloric and other acids are frequently formed, causing rapid corrosion, of the superheater coils while the foreign matter may ultimately clog the superheater, which always interferes with heat transfer.

With the increasing use of the steam turbine and the wider usage of superheated steam there seems to be a tendency to do away with the steam separator. The fact that should not be overlooked, however, that the steam separator is the last-line trench between boilers and prime movers. Its task is to collect most of the entrained moisture in the steam and serve the further purpose of holding back foreign matter that may be brought over with the condensate.

The steam separator is, therefore, a very important piece of equipment. Because it has no moving parts and because after it is installed it calls for practically no attention, is no reason why it should be ignored or overlooked. It is a good investment.

Water Treatment as a Cause of Trouble

"CHERCHEZ la femme" ("look for the woman") is an old French axiom. It means that wherever there is trouble or a crime committed, look for the woman who is the cause of it. This may not be quite just to the fair sex but it might well be paraphrased to read "look to the water" —when it comes to locating boiler room troubles.

Impure water is the cause of endless boiler room troubles. While it very often takes a chemist to locate the cause and find a remedy, it does not require much effort or knowledge to become suspicious of it. Gradually increasing stack tem-

peratures; boiler tube failures; decreasing values for "pounds of water per pound of coal;" inability to operate at high evaporation rates; debris carried over with the steam to cause unbalancing of turbine rotors, clogging of steam separators and traps, etc.; wet steam; corroded superheaters—these are some of the things that point a damning finger at impure water.

Look at your cost sheet and see how often tubes must be turbined. Check up and see how often units must be taken out of service for washing down. Look and see if your boiler capacity is radically curtailed at certain seasons of the year because of foaming or priming. Investigate the water.

Fuel, air and water are the three basic raw materials used in the production of steam. When properly co-ordinated, intelligently controlled and processed, they are vital factors in boiler room economy. None of them when used "as is" will result in as high efficiency as when used after some sort of treatment or conditioning. This is as true of boiler water as of the air or the fuel. Water treatment pays.

Wetting Down Coal to Improve Combustion

EMPHASIS is often laid upon the deleterious effect of moisture in coal. Minimum moisture content is desirable in fuel, for the purchaser buys water at the price of coal. On the other hand, the addition of water to coal before it is burned—known as "tempering" or "wetting down"—is beneficial for certain sizes of coal and under definite combustion conditions.

Unfortunately, the wetting down is usually done carelessly and without regard to using the minimum amount of water to obtain the desired results. In consequence, heat is wasted beyond what would be wasted in order to minimize other wastes and drawbacks.

The smaller coal sizes burn better when wetted. The fuel bed forms a more homogeneous mass, so lessening the formation of holes in the fire. With high draft intensities, less coal is blown away; there is less tendency for the uppermost strata of coal to avalanche down with certain types of stokers. The loss of unburned carbon in the ash pit tends to be less for the foregoing reason as well as because of the more uniform combustion. Less draft is required. These are real advantages of watering; but they are obtained at a sacrifice in heat value, although the loss of heat may be less than the loss due to the wastes that watering overcomes.

The heat required to separate the hydrogen of the water from the oxygen with which it is combined is exactly the same as that which must be obtained by the complete combustion of the hydrogen in the furnace. Whatever hydrogen is liberated unburned up the stack represents a direct loss. There is always some loss in this way. There is an additional loss, however, regardless of the loss due to the possible escape of unburned hydrogen up the stack. When hydrogen is burned, it is transformed into water vapor. Thus the water added to coal by "wetting down" outside the furnace is turned into steam and, as such, passes up the chimney. Heat units are used to superheat this steam to the temperature corresponding to that of the furnace gases. Some of this heat may be utilized, of course, as when economizers are installed, for the superheated steam is condensed and its latent heat of evaporation is utilized, so that the apparent loss is somewhat reduced. The condensation in itself, is corrosive, extremely so in the presence of the sulphur and carbon dioxide of the flue gases and soot. Therefore, even the absorption of heat in this way has its drawbacks.

The physical benefits of wetting down coal are greater than the chemical disadvantages. Wetting down may be lesser of two evils. It is desirable, therefore, that the minimum amount of water be used. Ordinarily, about three per cent of water by weight will be found most desirable, operating practice ranging from 1½ to 5 per cent by weight. As coal loses about 0.3 per cent evaporative value with 3 per cent moisture, it is obvious that the minimum amount of water that suffices should be used. Another thing to remember is that coal should not be watered just immediately before being burned, as it then has very little effect. It should be "wetted down" well in advance of the time that it is to be fired, otherwise hot water is preferable. It should be borne in mind, however, that water and coal together are corrosive and that hot water and coal are especially so. Where coal is wetted down in the stoker hopper, it is very desirable to use hot water instead of cold.

Screenings, coke breeze and anthracite burn better when tempered with water. Usually it will pay to check up the way in which the coal is watered, to determine the amount of water that should be used and to stress the importance of not using excessive amounts. The use of water is almost solely mechanical or physical, rather than chemical. Experiments will soon bring out the information required so as to reduce to the minimum the loss of heat due to the addition of water on the one hand yet to develop the maximum advantages, mechanically, from the use of water, on the other.

Six Reasons for a Water Softener

THERE are six inherent reasons why treated water may and usually will be more economical than untreated water. These are:

1—Saving in fuel consumption.
2—Saving of extra boilers or extending limitation of present boilers.
3—The elimination of stand-by charges while one or more units are out of service for scale removal.
4—Reduced cost of cleaning, retubing and repairing boilers.
5—Saving in cost of firing boilers taken out of service for inspection, cleaning and repairing, etc.
6—A lower rate of depreciation on boilers due to the elimination of pitting, corrosion and the expansion and contraction strain and other by-products of unfit water; lower insurance rates.

Treating the water may also result in three other economies. These are:

a—Eliminate cost of boiler compound.
b—Ability to pump water instead of buying costly city water.
c—Freedom from cleaning the piping system.

Lining Breeching to Combat Corrosion

STEEL breechings and stacks are sometimes lined with a protective covering, the purpose being two-fold, namely, to protect the steel from corrosion and to reduce the radiation loss, hence improve the draft. Where the steel work is protected merely to prevent corrosion, a paint is the least expensive, though not the most enduring. Paint cannot be used, of course, where the higher temperatures are encountered. There are several good paints upon the market prepared specially for this work—inhibitive and preventive, that prevent corrosion and are capable of standing up under the relatively high temperatures at the base of the stack. These paints can, of course, be applied seasonally, (if necessary), when shut down permits.

A more permanent—hence ultimately more economical—method is to use some plastic material, since once this is installed it "stays put" indefinitely. This material can be very easily applied. Its life is practically everlasting. There is no upkeep or attention required. It does not require skilled labor to apply it.

Corrosion tends to be greater where a stack is frequently taken out of service, as for example, where a plant is shut down during the summer months—because moisture then collects in it, whereas the heat of the furnace gases during the operation tends to prevent the formation of sulphuric acid by the condensation of moisture. In fact, while the furnace is in actual operation and the stack is kept in service, the only moisture at the base of the stack is that which comes off from the fuel. When the stack is shut down, rain, condensation and moisture collect and this is extremely corrosive in the presence of the sulphur in the gases.

Where brick, refractory material or plastic refractory is used, it is very important indeed to see that the interstices, voids and spaces between steel and material are filled up, otherwise moisture may and certainly will get in between the protective covering and the steel, with the result that corrosion will not be prevented.

Steam and Power Problems in Paper Production[1]

By FREDERICK C. STAMM
The Upson Company, Lockport, N. Y.

THE paper industry has made a rather poor showing during the past year due to an overproduction of from 10 to 25 per cent in almost every branch of the business. Furthermore, the reports show that even though there was a fairly good volume of business in almost every line, the price was so low that the margin of profit was practically wiped out. Profitless operation in business cannot continue to exist since one of the first laws of business is that an enterprise must be conducted at a satisfactory profit. There are a number of factors which will tend to relieve the situation: first, an increase in consumption; second, the elimination of some of the poorest mills, and third, a reduction in the cost of manufacturing.

Considering the first item, consumption has increased each year at a fairly steady rate so it is possible, barring the unforeseen, to estimate this factor fairly accurate. However, it is evident from the charts since 1919 that the capacity has also increased in almost exactly the same proportion as consumption. We can, therefore, expect very little help from that item. In regard to the second item, namely that of competition forcing some of the older mills out of operation, this seems to be less true in the paper industry than in practically any of the other industries and is due no doubt to the tremendous investment necessary in order to operate a paper mill. As a result even the smallest mill is able to obtain a very large amount of credit. We all know of mills which are run down, delapidated and have not made any money for years but still are able to limp along on the credit which is extended to them. Thus it seems that we can expect very little relief from this source. It therefore stands that the last item is the one to which we must turn for relief and rightfully so, because a decrease in manufacturing costs through the elimination of waste is a benefit to business in general as well as the industry itself.

Importance of Steam and Power

There is no doubt but what there are many places in almost every mill where the manufacturing cost can be reduced. In considering these places, it is well to review the items which go to make up the conversion cost and the relative importance of each one. The figures which I give here refer to the newsprint industry which through the medium of the News Print Service Bureau has been able to standardize their costs to a much greater degree of accuracy than any other branches. However, my experience in wrapping, book, and board shows that the relative importance of each item is about the same in most of the various branches.

PAPER CONVERSION COSTS

Steam and Power	40 per cent
Labor	20 per cent
Wires and clothing	8 per cent
Repairs	8 per cent
Miscellaneous	2 per cent
Overhead	22 per cent
Total	100 per cent

You will notice that the item of steam and power heads the list and in the average plant is from 50 to 90 per cent greater than labor. Also there is no doubt but what it is the one item on which it is possible to show the greatest return with the least expenditure of money and effort. In studying the item of steam and power there are three main factors to consider:

(1) The generation of steam in order that it may be produced at the lowest possible cost per thousand pounds.
(2) The generation of power so that it can be produced at the lowest possible cost per horsepower.
(3) The application and consumption of both steam and power in the various departments to see that they are used in the most economical manner.

Due to the standardization of boiler and engine room equipment, the first two factors offer very little difficulty and there is no excuse for any modern plant not being able to reduce their unit cost of steam and power to a minimum. The matter of application and consumption of steam and power in the departments, however, offers much chance for study and improvement in almost every mill and this can never be standardized due to the difference in equipment and production in the various mills.

Power Used in Stock Preparation

The largest item in the power cost is no doubt the power consumed in beating and in jordaning the stock. It is very hard to get accurate figures for comparison from the various mills making the same grade of paper, due to the fact that actual power in the beater room is seldom set up separately but lumped together with the machine room power. However, some figures which I do have on kraft preparation show a variation of from 500 to 800 horsepower per ton. There is no doubt but what there is a similar variation in all of the branches. Go to any two chip board mills making practically the same grade of stock and you will probably find one using 150 horsepower per ton and the other using from 75 to 100. Why is it? If one man can make a good sheet of thirty pound kraft with say, 500 horsepower, why should the next man take 800 horsepower? This is purely a matter of standardization and the man who can do more than any one else to standardize this one item is the superintendent.

Power Used in Pumping

Probably next in line of importance would come the matter of pumping. The tremendous quantities of stock and water which are pumped in a paper mill offer many chances for waste of power. Some mills re-handle the stock two or three times from the beaters to the machine. Other mills pump directly in one operation from the beaters through the jordans under pressure and to the head-box thus reducing the pumping cost considerably. Some mills use as high as 50,000 gallons of water per ton of paper, others as low as 5,000. Supposing the mill which is using 50,000 gallons could reduce this to the average of 25,000 gallons. This would mean a saving of 25,000 gallons per ton or figuring the power conservatively, approximately 10c a ton. In a 100-ton mill, this would amount to $3,000 a year. In other words, if we figure a 30 per cent return as a fair rate, we could afford to spend $10,000 in order to make this reduction.

There is another item which most of us forget to consider and that is the efficiency of the pump itself. The average cast iron, open impeller, fan pump has an efficiency of approximately 35 to 40 per cent. The new, modern, high speed pumps will average from 70 to 80 per cent, or a reduction of power of practically 50 per cent. Many of the older mills have pumps in operation which have been running for the past fifteen or twenty years. As production speeded up, the pumps were speeded up in proportion and many of them are no doubt working very satisfactorily today. We all know that the casings of centrifugal pumps are designed to take certain capacities at most efficient operations. Above or below that point, the efficiency decreases and there is no doubt but what these old fan pumps which have been speeded up are hogs for power. I know of one mill where a 50 horsepower motor was burning up, operating on a condition such as I have just explained. A twenty-five horsepower motor on a new high speed pump ran comfortably cool.

Steam Used in Drying

Next in importance is probably the steam used in drying. There has been much said and written about this subject and consequently I hesitate to say much about it. Still there is plenty of chance for improvement in the average mill. The steam consumption per pound of paper in drying alone varies over a wide range. Some mills will use 4½ pounds of steam per pound of paper; some 3½. The best mills use about 2¾ pounds, while a recent advertisement which came to my desk

[1]Presented at the meeting of the Northern New York Division of the American Pulp and Paper Mill Superintendents Association held at the New York State College of Forestry, Syracuse, N. Y., on April 26, 1930.

stated that one mill was actually using less than two. This seems so low that it is a little bit hard to believe and I cannot help but think there are some factors which they have not taken into consideration.

This wide variation in the amount of steam consumption shows that there is still chance for improvement in many mills. Supposing a mill is able to reduce its steam consumption in the dryers from 3½ to 3 pounds. A reduction of ½ pound does not off-hand seem of great importance but is equivalent to 1,000 pounds per ton and in the average 100-ton mill would amount to a saving in steam of approximately $12,000 per year. Again if we consider a rate of 30 per cent as satisfactory, we could afford to spend around $35,000 in order to accomplish this result.

In order to improve drying, there are two factors to consider: first, the drainage or removal of air and water from the machine in order to obtain the greatest possible heat transfer; second, the control of temperature so that the moisture leaving the machine will be uniform. With all the different kinds of drying systems at the present time, it is a very hard thing to decide just what constitutes a good drying system. Fundamentally, the theory of drying is a very simple one. First, the dryers must be kept clean of oil and rust. Second, there must be a differential of approximately 2 pounds maintained between the inlet and the outlet of the dryer. Water will not run up hill and since the water lies in the bottom of the dryer, it is necessary to maintain enough difference in pressure to lift the water up through the syphon pipe and force it out though the journal. Third, remove nothing from the machine header but condensate and air. Any system which covers these three main points will operate satisfactorily and efficiently.

Far more important in my mind than drainage is the question of controlling the moisture leaving the machine. At present, there are four distinct systems of moisture control: first, the tension method, such as the Stickles; second, the radio control; third, the plain pressure control, and fourth, humidity control, such as has been developed by Taylor. Practically all of these have some drawbacks. Either they are not sensitive enough, or the equipment is not reliable, or the mechanism is so complicated that it takes a trained man to keep it in operation. However, any one of them is better than the plain hand control from a standpoint of investment. When you stop to consider, one-half of 1 per cent increase in moisture in the finished sheet not only gives you in most cases a better sheet for strength and finish but in a 100-ton mill would save moisture equivalent to 150 tons of paper during the course of a year. Figuring this paper at a selling price of $75 per ton would mean a saving of $11,000 per year. Again considering a 30 per cent rate, we could afford to spend around $30,000 if it would enable us to increase the moisture in the paper ½ of 1 per cent.

There is still one more factor in drying, the importance of which is appreciated by very few people at present and that is a gradual control of temperature. Only one manufacturer is strongly stressing that point at present and that is Penberthy. The process of removing water from a wet sheet of paper may be divided into two stages: first, the evaporation of the free water surrounding the fibers and second the evaporation of water of hydration that is on the inside of the fibers. As long as there is free water surrounding the fibers, there is very little shrinkage and also very little damage can be done to the sheet. As the sheet gets to a point where the free water has practically been evaporated, the fibers can no longer move on each other with ease and are cemented and bonded together and further shrinkage of the fibers will cause an infinitesimal tear and break of the bond. Briner and Guild in their extensive experiments prove fairly conclusively that there was very little loss of strength in a sheet of paper until it had passed over approximately ¾ of the amount of dryers. After the free water is evaporated, there is approximately 15 to 20 per cent water left in the sheet and this water is in the form of hydrated moisture which is actually beaten into the fibers. In order to remove this water, the sheet must be carefully handled. If maximum strength is to be retained, the last traces of free water as well as the water of hydration should be carefully and slowly removed and at as low a temperature as possible. Practically all the shrinkage on the average machine takes place from this point on.

If high temperature is applied in the last few dryers, the fibers shrink so rapidly that they do not have time to readjust themselves and actually tear and break the bond between the fibers. Slow, even drying, on the last few dryers allows the fibers to readjust themselves with the result that the bond is not broken. Pactically all of the cockles which are formed on the average machine are formed at this very point and are due to the rapid removal of the water of hydration and rapid shrinkage of the fibers. Briner says that the loss of strength due to the break of this bond after the fibers have set amounts to from 20 to 30 per cent and is caused entirely by too rapid drying at the dry end. There is much chance for improvement and study along these lines and at present very few manufacturers have turned their attention to this particular item.

Miscellaneous Losses and Waste of Power

Many of the new, modern mills are very well designed and the large uses of steam and power are very efficiently taken care of. However, it is safe to say that all mills, due mostly to lack of individual attention, waste thousands of dollars of power and steam a year on small individual items. For example, an increase of approximately one pound of steam per pound of paper should be sufficient to take care of the winter heating demand in the average mill. However, this increase varies from one pound to five pounds. Practically every paper mill is overheated in the winter time. The only expense necessary in order to overcome this waste is a little personal attention on the part of a heating inspector.

Another item is the matter of pipe covering. How many of you realize that every dollar spent in covering a high pressure steam line will save $9.00 worth of coal during the course of a year? A 900 per cent investment is certainly one worth considering.

The matter of lubrication amounts to only 10 to 20c per ton of paper but I know of one large mill which reduced the cost of lubrication from $21,000 per year to approximately $11,000 per year and the only expenditure necessary was a little personal supervision on the part of one man. These seemingly small, unimportant items many times amount to thousands of dollars per year and nowhere can a better return be shown than an effort to study and reduce many of these small, insignificant items.

Importance of a Steam and Power Balance

Probably the foremost item which has done more than anything else to help reduce the cost of steam and power has been the development of the bleeder turbine. In order to reduce steam and power cost to a minimum, it is necessary to have a perfect balance between the power and steam demand so that there will be no surplus exhaust going to the atmosphere and no live steam reduced directly from high pressure to low pressure. In order to do this, it is necessary for all mills to have a certain amount of the power load available so that it can be switched to either condensing or non-condensing as the occasion demands. In the average mill making specialty papers, it is almost impossible without a bleeder turbine to reach a good steam and power balance. On lightweight paper, the speed is generally high with a consequent high demand of power. Production, however, is generally below normal with a consequent low demand for steam in the dryers. This invariably, in the average installation, results in a waste of steam to the atmosphere. When this machine changes to a heavy sheet, the slow speed will have a low demand for power while the production which will naturally be above normal will call for a large demand of steam. As a result, in the average mill, it will be necessary to bleed live steam into the low pressure header to supplement the lack of exhaust. The same cycle holds true for both the summer and the winter heating. With a bleeder turbine automatically floating on the exhaust line, these conditions are really anticipated before they occur and the use of steam and power can be nicely balanced regardless of the production on the machine or the weather conditions on the outside.

The primary purpose of plant research is to increase the efficiency of a process in order to decrease costs of production or to make a product of superior quality. The pulp and papermaking process offers innumerable opportunities for research. Every pulp mill has the opportunity of increasing its yields, raising its quality and utilizing its by-products through methodical scientific experimentation which is research. Every paper mill is offered increased profits from the re-use of white water, faster hydration, more economical water removal, and a cleaner sheet. All of these things and many others can be accomplished and actually are being accomplished through plant research for which the scientific training of a chemist should eminently fit him.

The wide-awake mill is constantly seeking to improve its product and it accomplishes this object by product research. A critical study of the product of any mill will reveal opportunities for improvement. Sometimes such improvements can be made at a distinct profit to the mill. We have in mind the case of a board manufacturer who continually had difficulty in sizing his product satisfactorily. With a certain type of measuring instrument, his product gave a test of 10 minutes. Various expedients were tried without much success until finally a size emulsifying and dissolved alum plant was installed, which, together with certain changes in the method of operation, enabled the plant to maintain a size test of 100 minutes with 50 per cent less size and 70 per cent less alum than before these changes were made.

In connection with the study of a mill's product, it should be noted that one of the outstanding advantages to the mill, resulting from the employment of a chemist, lies in the establishment of a set of specifications or standards of quality for each of the mill's products. As a result of daily routine tests, the chemist is able to obtain a numerical expression for every characteristic of the paper which it may be desirable to evaluate. Mills not possessing such records are often unable to determine whether or not a change in raw material or in their process is of any advantage to them, and their efforts toward improvement are therefore often detrimental rather than beneficial to their product.

The employment of a competent technical man by a paper mill affords an excellent opportunity for the mill to build up its good will among its larger customers by offering the expert services of this man to these customers for a study of their paper and printing requirements. In almost all cases such a study will be mutually beneficial, since it will assist the consumer in a better utilization of his paper and it will acquaint the manufacturer with the defects in his product so that they may be eliminated, in so far as possible, in the manufacturing process. This phase of paper merchandising is being popularized by some of the larger companies who detail specially trained men to this work with marked success for all parties concerned.

We have attempted to indicate, in the brief time available, some of the advantages resulting from the employment of a technically trained man in a paper mill. Many of the examples cited were extremely simple and these were chosen purposely to indicate that some of the greatest advantages result from control of the simplest processes. There is no dearth of problems of greater complexity in the paper industry but the greatest need is for every mill to appreciate the necessity of considering the simple problems along with the complex.

In this connection it is gratifying to note the increased employment of technical men by the New York State mills, which indicates that these mills are becoming "chemically conscious" and we are operating each year on a more scientific basis. We believe that this trend is a logical one and will do much towards insuring a sound development of the industry by eliminating waste, increasing profits, and promoting the general welfare of the thousands of people engaged in paper mill work.

E. A. Clark, sales engineer of the Philadelphia Office of the Reliance Electric & Engineering Co., has been advanced to the engineering department in Cleveland where he will be engaged in the design of direct current motors.

Logging Waste: A Challenge to the Pulp Industry of the Douglas Fir Region[1]

By ALLEN H. HODGSON

Associate Forester, Office of Forest Products, U. S. Forest Service
Portland, Oregon

A DETAILED survey of logging waste in the Douglas fir region has recently been completed by the Forest Service. The findings of this study have been published serially in the Pacific Pulp and Paper Industry and the West Coast Lumberman, and the report, now in reprint form, has been distributed. The results of this research are, therefore, quite generally known, but some of the facts developed by it are so important as to be worth repeating here.

Within the Douglas fir region the annual accumulation of material of cordwood size and larger, now being left in the woods unused after logging, amounts to 3,088,748,000 feet, log scale, or 6,177,496 cords of sound wood. This figure looms large when one realizes that it is equal in footage to almost one-tenth of all the lumber annually produced in the United States, and exceeds, by more than one-half million cords, the total pulpwood cut annually in this country. The total quantity of wood used for pulp in Oregon and Washington amounts to about 1,000,000 cords per year. If this waste material were broken down into pulp chips and hogged fuel, and loaded into hogged fuel cars containing 20 units each, 386,000 cars, making a continuous train 3,000 miles long, would be required to hold it.

More than one-third of this amount of unutilized wood—1,146,276,000 feet or 2,292,552 cords—is western hemlock, Sitka spruce and "white" fir woods, which as you know, are in demand for sulphite and mechanical paper pulp and to some extent for sulphate pulp. The balance—1,942,472,000 feet or 3,884,944 cords—is Douglas fir, western red cedar, and other species such as Port Orford and incense cedar, sugar, western white and yellow pine, woods with high values for lumber but having comparatively low pulping properties, at least when reduced by present commercial processes. A substantial quantity of Douglas fir is used in the manufacture of kraft paper and fiber products, and some of it, in mixture with black cottonwood is, by the soda process, converted into writing and book papers. There is also a possibility that research will develop economical ways for producing strong light colored papers from this species. It now looks as if Congress will appropriate $25,000 to enable the Forest Products Laboratory at Madison, Wisconsin to spend more time in studying the pulping possibilities of western woods, particularly Douglas fir.

At the present time about one-half of the annual accumulation of logging waste—3,252,000 cords—is Douglas fir but if present logging practices continue, very soon this proportion will, no doubt, give way to an increased quantity of western hemlock since the percentage of the latter species is rapidly increasing in the commercial stands of virgin timber. At present only about 13 per cent of the annual lumber cut is hemlock, but authorities are now predicting that by 1935 at least 25 per cent of the regional production will be of this species.

More than one-third—2,710,000 cords—of all the unused logging waste found in the region is within the Puget Sound district. This is largely due to the great size of that district as compared to the others studied, to the activity of the lumber industry within it and to the fact that a considerable percentage of its timber is western hemlock, a species having at present a relatively low commercial value as sawlogs for the production of lumber. For much the same reasons, one-fourth—1,563,000 cords—of all of the logging waste is found in the lower Columbia River district.

Great variations were found in the amount of material left in different operations. In some cases the waste amounted to 75 or 80 per cent in volume of the original stand of timber while in others it represented only 10 per cent. As a general average, 21,407 board feet or 43 cords per acre

[1]Presented at the meeting of the Pacific Coast Section of the Technical Association of the Pulp and Paper Industry, held at Longview, Washington, April 5, 1930.

of sound material, cordwood size and larger, are left on the ground as logging waste. This unutilized wood is equal to almost one-fifth of the original stand of timber. In many parts of the world, where the pulp and paper industry is quite active, a forest averaging 43 cords of wood per acre is considered a very heavy stand of timber.

These figures show that enormous quantities of wood, containing many physical and chemical values, are annually left after logging in this region as waste. How profitable to collect and transport this unused wood to a consuming market

White Fir Logs Discarded for Lack of a Market

In the absence of a reasonable market for white fir these logs containing high pulping values were left to rot on the ground.

is a difficult riddle, the answer to which offers many important economic possibilities. While involved, and so far, unsolved, the problem offers a few known and suggested points for attack.

Making Profit Out of Waste Wood

An increase in the value of low-grade, crooked and small logs, which would make it economically possible for the logger to bring out material of this type, would of course automatically reduce the woods waste and there is no question but that the pulp and paper industry is already exerting an influence in this way. An example of how this influence is working has recently come to attention and since it nicely illustrates a number of general trends of great im-

Second Growth Hemlock Destroyed in Logging

The pulp and paper industry of the Douglas fir region should be vitally interested in the protection and continued growth of timber like this for its future timber reserve value

portance there may be sufficient excuse for describing it in some detail.

A certain operator began as an independent logger, cutting his timber and selling all of the logs in the open market. Hemlock logs could not be sold to advantage and by necessity large numbers of them were left in the woods. To take care of these logs and to enable the company to make use of them a medium-sized, fast, sawmill was built and was devoted to the manufacture of western hemlock lumber, a market for which had been found. The next step was the erection of a modern pulp plant nearby which agreed to purchase from the sawmill and to utilize in the production of pulp all suitable waste wood, in the form of slabs, edgings and trimmings. This arrangement resulted in the establishment of a wood-cleaning and pulp-chipping plant at the sawmill where the waste wood is sorted, cleaned and chipped and from which the manufactured chips are conveyed to the pulp mill at a minimum of cost and trouble.

Near the hemlock mill stands a Douglas fir sawmill. The management of these two separate sawmills joined forces in

Short Chunks and Small Logs Left After Logging

A characteristic view of material left after logging in the Douglas Fir region

the construction of an electric power plant, located within a short distance from both sawmills and the pulp plant. The electric power generated here is produced by burning hogged fuel made from the sawdust and other sawmill waste at both mills. In the case of the hemlock mill, of course, this waste is in the form of wood not suitable for pulp chips and refuse such as defective wood, bark, black knots, etc., which result from cleaning the selected wood at the chipping plant. The electric energy produced is used to operate both sawmills, the chipping plant and the pulp mill and a considerable quantity of it is sold to the nearby town and surrounding country for light and domestic purposes.

The next development was a change in the logging and milling practices of the company which owns the hemlock

Small Hemlock and Douglas Fir Trees Left as Waste

In this case there were about 70 such trees per acre, amounting to 60 cords of woods suitable for pulp, left on the ground after logging.

sawmill. The logging department is now bringing out practically all of the low-grade, crooked and small logs which are suitable for pulp, even though they contain no lumber values, and is leaving comparatively little waste in the woods. At the mill pond the good logs, suitable for lumber, are sorted out and the poor logs, suitable only for pulp, are floated into a separate pocket. The sawmill operates a day shift and a night shift. During the day shift the better logs are sawed into lumber, the waste wood, including some low grade No. 3 Common lumber, being used in the regular way

by the chipping plant. During the night shift the poor logs are run through the mill. These are simply broken down at the head saw, cut into squares by the main edger and bucked into four-foot lengths by the trimmer. In other words, with a relatively small night crew to operate the mill the logs are simply broken down into pulpwood. Material not suited for pulp chips is converted into hogged fuel.

Here is found a combination of several agencies so coordinated as to function in effect as a single, well-balanced, give-and-take undertaking, which has not only whipped the sawmill waste problem but is making a telling impression on the waste in the woods.

The woods waste problem has for a number of years received the consideration of the logging industry. For example, at the last meeting of the Pacific Logging Congress

Western Hemlock Logging Waste

Four characteristic ways in which western hemlock, a splendid pulping wood, is wasted in the Douglas fir region, namely: broken logs, large tops, stumps cut too high and small trees left standing to be destroyed by the customary slash fires.

a part of the program, which permitted the exchange of ideas and experience, was devoted to this subject.

Several logging companies have spent a number of years in experimenting with different methods for securing better utilization at a reasonable cost.

One company has been working on the problem since 1919 and reports more or less satisfactory results. It has developed a two-step method of logging; that is, after the major operation has finished, the remaining small logs, chunks and culls are brought in and loaded onto cars with horses or with small steam yarders and locomotive cranes.

Another company, which has experimented in handling logging waste for many years, has made use of light, mobile machinery, such as caterpillar tractors, and small gasoline yarding donkeys. In this case the caterpillar tractors equipped with drums for use in high-lead yarding seemed to offer the best possibility. Relogging was entered into by this company on a commercial basis two or three years ago and at that time it was apparently satisfied with results. With a change in timber type and ground conditions, however, the operation was not feasible, which goes to show that a single solution will not be applicable to all conditions.

Pre-logging, or taking out the small trees in advance of the major operation, has been considered, but no examples of the use of this method are known.

The construction of a movable wood cleaning and chipping plant, mounted on flat cars, which can be taken to the logging works immediately after logging, has also been suggested as a possible solution. Plans and specifications for such a plant have been prepared, but as far as is known no practical demonstration of the proposed equipment has ever been made.

Utilization of Waste Wood a Growing Industry

The more complete utilization of sawlogs and the so-called mill waste resulting therefrom at the sawmills, as suggested in the example referred to above, will and is having its effect upon logging waste. It increases to some extent the values which may be secured from the logs, thus permitting the logger to bring out logs which are slightly smaller and lower in grade than he could otherwise do.

A negligible amount of slabs and other mill waste has been used for years by the paper industry of the region, but it is only in the last four or five years that such waste has been used in considerable volume for pulp. Now practically all the pulp mills use some mill waste and in a number of cases it constitutes the entire wood supply. It comes to the pulp mill in various forms, such as slabs, sawmill and box factory trimmings and edgings, or pulp chips, more often the waste is converted into pulp chips at the sawmills, with the necessary chipping equipment installed and operated by the pulp manufacturer, or a subsidiary company. Almost without exception new plants have located with regard to supplies of mill waste and in several cases complete integration has been obtained, the lumber, power and pulp and paper units being parts of one plant.

Within the last three or four years a new industry of considerable magnitude, based entirely upon the utilization of waste wood, formerly sent to the refuse burners of sawmills has developed in the Douglas fir region. Hundreds of thousands of dollars have been invested in equipment for reclaiming this material and for converting it into pulp chips for use in the manufacture of high-grade sulphite and kraft paper and into hogged fuel for use in the production of heat and power. Hundreds of men have been given employment. It has been stated that the net income to the sawmills of the region has been increased by more than a million dollars and the pulp and paper industry has secured a supply of raw material at a comparatively reasonable cost. One authority estimates that in western Washington alone the pulp mills are consuming between 600,000 and 700,000 units (a unit equals 200 cubic feet) of pulp chips per year, all made from sawmill waste, not to mention the great quantity of hogged fuel, made from sawmill waste which is used as fuel in the generation of power.

From the standpoint of the future prosperity of the pulp and paper industry there is a distinct advantage in the present utilization of this waste wood. Ultimately, when the virgin timber is gone, no industry will be more dependent upon the proper management of forest lands and the sustained production of forest crops than will be the pulp and paper industry. The nature of its operation calls for a large and continuous supply of wood. The huge amounts of raw wood required, if not secured from waste, must come from the growing forest and it has been predicted, with a considerable degree of assurance, that the virgin forests of the Douglas fir region, at the present rate of cutting, will not last many decades. Rough estimates suggest that the timber in this region is being cut three times as fast as it is being grown but the same authorities state that with proper forest management and protection from fire the potential producing capacity of ultimate forest lands would about equal the present annual cut, or between nine and ten billion feet.

This statement is not made for the purpose of introducing a pessimistic note but simply to call attention to the importance of complete utilization of wood and to the necessity of keeping the forest lands of the region productive.

Investigation indicates that practically all of the easily available hemlock and Sitka spruce sawmill waste in the Douglas fir region, which can be secured at a reasonable cost, is now being absorbed by the local pulp mills. At the present time any further expansion in the production of pulp will be by necessity have to depend more on "forest wood" sawlogs, or logging waste for raw material.

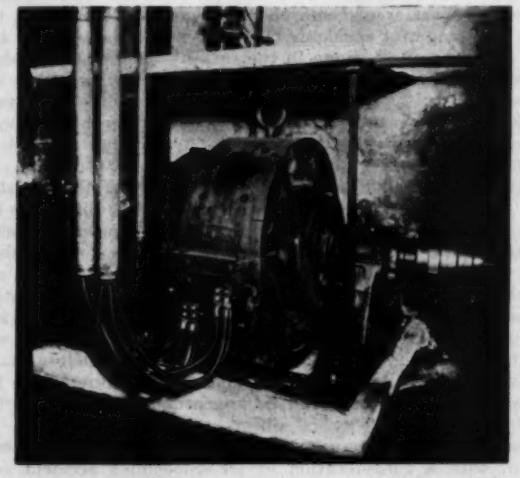
To cut "forest wood" from growing trees, unless it is done on a sustained-yield basis, is bad practice from the standpoint of the pulp industry of the future, if the raw material can be secured from other sources. This practice will in time reduce the supply of reserve second growth timber which some day may be of inestimable value to the industry. To depend entirely on sawlogs, suitable for lumber, also has its dangerous aspects aside from the economic loss. A slight increase in the price of lumber would raise the cost of such logs to a point where it would be poor economy to use them for pulp. The only other source of ray material available is logging waste.

As suggested, some progress pointing to the utilization of logging waste is being made, but the fact remains that in this region, where the pulp and paper industry is so firmly entrenching itself with the expectation of a long and prosperous life of continuous production, more than six million cords of raw material suitable for pulping purposes, in one form or another, is annually left as waste by the logging operations, to rot on the ground or to be destroyed by fire. In the complete and profitable utilization of this material lies a challenge, not only to the owner of stumpage and the lumberman, but also to the best minds and the ingenuity of the pulp and paper industry of this region.

New Drive Speeds Up Paper Machine

An interesting application of a modern single motor paper machine drive was recently made on a machine in the plant of the Paul A. Sorg Paper Company at Middletown, Ohio. The drive itself is similar to that being installed on many other paper machines at the present time but the history of this particular machine gives it special interest.

The machine, which was installed in 1909, was the first electric driven paper machine in the Miami Rivet Valley and one of the first in the entire country. The original electrical equipment consisted of an engine driven generator furnishing power to a 100 hp., 220 volt, direct current driving motor, belted to the line shaft of the machine. By varying the generator voltage and hence the speed of the driving motor and by changing the driving pulleys, the paper speed could be varied over a range of from 80 to 300 feet per minute. There was no automatic means of keeping the paper speed constant under fluctuating loads, but nevertheless, this equipment operated satisfactorily until demand for increased production made a change necessary.



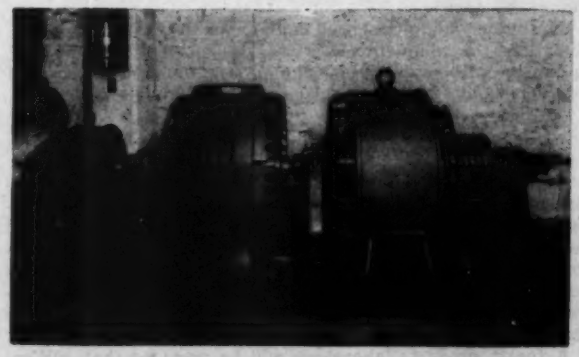
View of the 300 hp. 230 volt driving motor directly connected to the paper machine line shaft. A dry shield has been built over the motor

In 1918, it was decided to increase the maximum paper speed to 650 feet per minute, maintaining the same minimum speed. The motor was of course too small to carry the increased load and was removed. By making certain changes in the generator it was converted into a driving motor with a rating of 175 hp., at 400 volts DC. A new engine driven generator of suitable capacity was installed and with the increased rating of the driving equipment it was now possible to cover a paper speed range of from 80 to 650 feet per minute.

In 1926, the paper machine went through certain mechanical changes although the electrical equipment was unchanged. The number of dryer sections were doubled and the beveled gears on the various sections were replaced by Cleveland worm gear units.

Recently, demands on the machine again outgrew its capacity and again the solution to the problem lay in increasing the upper speed limit, this time to a paper speed of 800 feet per minute. During the past October, the old electrical apparatus was completely replaced by the latest type of single motor paper machine drive equipment manufactured by the Westinghouse Electric and Manufacturing Company. This equipment consists of a motor generator set, a driving motor, a pilot generator and a control panel hav-

Control Panel showing the two motor operated rheostats on the left. The lower rheostat, operating in the armature circuit of the pilot generator is controlled by the remote master switch. Its position determines the speed at which the pilot generator must operate in order to keep the speed regulator in equilibrium. The upper rheostat controls the speed of the machine and automatically rotates to a position that will speed up the driving motor and line shaft to a value that allows the pilot generator to satisfy the conditions demanded by the position of the lower rheostat. On the right hand section are shown two carbon pile regulators; one maintaining a constant exciter voltage, and the coil of the other, being in the armature circuit of the pilot generator, responds instantly to any tendency of the line shaft to change its speed and thus compensates for any attempted speed change



Motor generator set, consisting of a 335 hp., 440 volt, 3 phase, 60 cycle, synchronous motor, a 212 kw. 230 volt, direct current generator and a 10 kw., 125 volt exciter

ing mounted upon it (in addition to the necessary relays, contactors and instruments) motor operated rheostats for remote speed control and the Westinghouse carbon pile type of speed regulator which maintains a constant paper speed at any setting over the entire speed range from no-load to full-load.

The motor generator set consists of a 335 hp., synchronous motor, a 212 kw. direct current generator and a 10 kw. exciter, all with a common shaft and mounted on a common bedplate. The 10 kw. exciter supplies excitation for the fields of the synchronous motor, the main generator, the main driving motor and the pilot generator, in addition to supplying power for the various relays and contactors. The motor generator set and the control panel are located in a room remote from the machine room.

The driving motor coupled directly to the line shaft is rated at 300 hp. and can, by a combination of variable voltage and field control, be driven at speeds variable in very small steps over a range corresponding to the entire paper speed range of 80 to 800 feet per minute.

With the new speed limits, it became necessary to provide automatic regulation in order to hold constant speeds in spite of load fluctuations and this is accomplished by means of the pilot generator and the carbon pile type of speed regulator, both mentioned above. The pilot generator is chain driven directly from the line shaft and as its terminal voltage responds to any change in speed of the paper machine, it acts through the carbon pile regulator to raise or

View of paper machine line shaft showing chain driven pilot generator in the foreground and main driving motor in the background. Magneto for speed indicator is shown on bracket

lower the main generator voltage and thus instantly compensate for tendencies on the part of the paper machine to change its speed.

Before increasing the speed of the machine to the new maximum limit, a complete check was made of the mechanical equipment, although only one change was found necessary and that consisted merely of replacing a questionable pulley.

Montana University to Teach Wood Utilization

Dean T. C. Spaulding, of the Forest School of the University of Montana, in a letter to the National Lumber Manufacturers Association, on the occasion of its recent annual meeting at Chicago, announced that the school will be transformed from a school of silviculture to one of wood technology, explaining that the wood problem before the American people at this time requires emphasis on utilization more than on the forest perpetuation side.

A forest products laboratory will be provided that will cooperate with the research work of the U. S. Forest Products Laboratory and of the National Lumber Manufacturers Association.

Massachusetts Safety Conference

State's Development in Safety Work and Age Range of Accidents Among Topics Discussed

SIGNIFICANT to many safety engineers, managers, and insurance men and women present was the statement of Dr. C. S. Slocombe, safety adviser of the Boston Elevated R. R. at the annual meetings of the Massachusetts Safety Council that younger men are far more prone to accidents than middle aged and old men. From every standpoint except the one of length of lost time per accident the younger inexperienced men were found to show up most poorly not only in the experience of public utilities but of industries, individual plants, and in a few cases in the industrial records of entire states such as Wisconsin and Michigan.

Sessions of the Council were held at the Hotel Statler, Boston, April 30th and May 1st. The first day was given entirely to highway safety, the second to industrial safety and accident prevention. An exhibit of safety appliances, antiseptics and related materials was shown in a room adjoining the convention hall.

Age Range of Accidents

Dr. Slocombe has achieved a nationwide reputation for his safety work with the Boston street railways, subways, elevated and bus lines comprising the Elevated system both in respect to passenger and employee safety. The Doctor presented a series of comprehensive charts proving that the peak age range for accidents per 1,000 men is between 21 and 25. About the best range in the case of the elevated system is between 36 and 40 in so far as the number of accidents are concerned per 1,000 employees, and the decline was very marked. There were twice as many per group in the young range as in that between 55 and 60 although there is a marked upturn after age 60 is reached.

Temporary injuries was the chief subject of these statistics, for as permanent injuries go, there is less difference between age groups. The slower recuperative powers account in large part for a materially longer lost time for the older men, and in those past 60 this factor was particularly noticeable. Speaking of classes of accidents, he found duration of lost time greater in young men out for burns, scalds and similar accidents but in all other classes the duration was greater in the higher ages. Nevertheless, after a close examination of statistics from many sources, including those for Massachusetts, he could find no appreciable difference in the type of accident suffered at different ages.

The pendulum swung sharply in favor of the older men again, with a consideration of Dr. Slocomb's accident cost charts. These showed the cost of $5 per employee up to age 25, a cost of $1.50 from 31 to 35 and a sharp swing upward after forty to around $32 after 65. However, at all the so-called middle ages the cost was below that of the young men under 25. An even more specific and definite check on these figures was shown by an "experience chart" not directly related to age, indicating a steady decrease in accidents with the increased years of experience.

The State's Progress in Safety

Philip R. Allen, president of Bird & Son, endeavored to connect the Tercentenary of the Massachusetts Bay Colony, celebrated this year with the development of safety. For 280 years there was an almost complete lack of any concerted or individual effort to promote accident prevention. The first feeble efforts consisting of warning signs and guards on certain machines reduced accidents 35 per cent to 50 per cent in Bird & Son's plants. Mr. Allen discussed the Shop Safety Committees in the Bird plants and strongly favored his company's plan of having the personnel of these committees changed to convey as widely as possible a sense of responsibility for promoting the work. He told of the record of one mill with many hazardous operations which succeeded in going 23 months without a lost time accident, operating three shifts with 250 workers. Hours lost in Bird plants by injuries were 3,240 in 1925 and 1,484 in 1929. Mr. Allen favored a safety director whose time is given largely, if not wholly, to the work. He believed that safety progress

will be slow and steady and must overcome great handicaps in the modern tendency to speed up and overproduce. A saner more balanced production of all commodities following this era of abnormal overproduction will facilitate the spread of safety. When the 150,000 plants throughout the country which have no safety program make a start in this direction accidents will be reduced 50 per cent he believed.

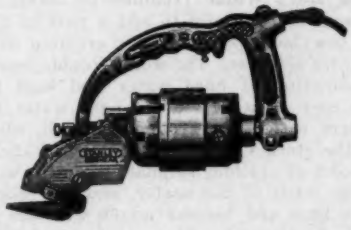
The Importance of Treating Fractures

Dr. Charles L. Scudder, Chairman of the Fracture Committee of the American College of Surgeons, outlined the progress in treatment, the increased knowledge of sterilizing agencies which have reduced fatalities from compound fractures from 85 per cent to a negligible figure and emphasized the need of prompt, capable medical attention in every plant. Every fracture is important, every injury to the head is important and potentially dangerous said Dr. Scudder, and possibly disabling. Under the new conception bones are no longer regarded as dry sticks to be mechanically mended with consequent complete recovery, fractures are regarded now as injuring a very sensitive complex human entity. He freely mixed glaring examples and comparisons with his pleading for better care of fractures. The wrenched knees of Harvard athletes are cured in two weeks, badly cared for industrial workers with the same injury have been idle four months. In conclusion he urged that every fracture be treated as an emergency, be treated immediately, not when swelling has subsided, and with first rate medical skill.

An Electric Sheet Metal Cutter

The Stanley Electric Tool Company, subsidiary of The Stanley Works, New Britain, Conn., has purchased the trade name, stock on hand, tools, jigs, fixtures, etc. of the Unishear Company, 270 Lafayette Street, New York City, and will continue the manufacture and development at their main plant in New Britain, Conn.

The most popular item in this new line is the "Mighty Midget," shown in the accompanying illustration. Reported



to be the only thing of its kind on the market, this tool is a great time saver wherever sheet metal and other similar materials are to be cut.

The "Mighty Midget" weighs only 6½ lbs. and with a minimum radius of one inch, it will handle all cuts—straight, curves or notches. Its capacity is 18 U. S. Gauge (.050") sheet iron—other materials in proportion. This tool can be used to cut not only such materials as sheet steel, aluminum, copper, etc., but also linoleum, fabric, fiber, leather, cardboard, wire mesh and other sheet materials of this nature.

Spiral Bevel Gear Right Angle Speed Reducer

D. O. James Mfg. Co., Chicago, announces a new type right angle speed reducer which consists of spiral bevel gears mounted on Timken Roller Bearings. This new line includes both horizontal and vertical types with slow speed shaft extended either upward or downward.

Ratings range from one quarter horsepower to one hundred horsepower with ratios 1:1 to 6:1. Larger reductions are obtained by the combination of the spiral bevel gear and planetary spur gears with ratios 8:1 to 1600:1 or more. The gear teeth and bearings are lubricated by means of the splash system.

Plater Output Increased 100 Per Cent

The output of the plater shown in the accompanying picture was increased 100 per cent by applying a Reliance automatic reversing motor drive such as used for planers.

To move the stacks of sheets to be plated back and forth between the high-pressure rolls the operator pulls a handle

back and forth in the same direction as the stacks of sheets go. At the back of the plater there is a spring board arrangement which starts the stacks back into the rolls when the operator reverses them. The sheets which are placed between metal plates and stacked to a height of six to eight inches are passed between the rolls five to seven times depending entirely on the grade of paper and finish desired.

With the old type of drive the operator was kept busy taking car of one stand of girls. Now double the number of girls are required to prepare the stacks of alternate sheets of paper and sheets of metal for the plater.

According to announcement made by the Forest Products Laboratory, Madison, Wis., the first serious attempt ever made to obtain reliable figures on the forest resources of the entire United States is now getting under way. Research and administrative heads of the U. S. Forest Service met the first of May at the Forest Products Laboratory to plan the forest survey. The work will be carried out under the terms of the McSweeney-McNary act. Activities will start on the Pacific Coast and will be extended and organized on a nation-wide basis.

Effective at once, Link-Belt Company's Baltimore, Md., office will be located at 913 Lexington Building. The telephone number remains the same—Calvert 5741. H. D. Alexander is in charge of this office.

The New York office of the Chain Belt Co., Milwaukee, has been moved from 50 Church Street to the new Chrysler Building, 405 Lexington Ave. W. H. Quinn is the New York district manager.

The Chicago office of Bailey Meter Co., Cleveland, has been moved to the Civic Opera Building, 20 N. Wacker Drive. R. V. Knapp continues as branch manager in this territory.

Allis-Chalmers Manufacturing Company has moved its Chicago district office to the new Civic Opera building, 20 North Wacker Drive.

Ralph R. Newquist has been appointed sales engineer of the Chicago office of the Reliance Electric & Engineering Co., Cleveland, Ohio.

Hooker Electrochemical Co., announces the removel of its executive and sales offices from 25 Pine street to 60 East 42nd street, New York City.

Connecticut Valley Supers Meet

New Kinks Learned from Highly Informing Paper on Beater Sizing

MEMBERS of the Connecticut Valley Division of the American Pulp and Paper Mill Superintendents' Association who attended the May meeting in Holyoke, Mass., on the third of the month, were treated to a most informing and suggestive paper and discussion on the mechanics and chemistry of beater sizing. The author of the paper was Gerard H. Lafontaine, technical director of Bennett Incorporated, Cambridge, Mass. There was a business session in the afternoon and a dinner dance in the evening at Hotel Nonotuck, which was headquarters. Some sixty-five members and guests attended the business meeting and upwards of 100 registered for the dinner dance, ladies being invited.

Matthew V. Horgan presided and introduced Mr. Lafontaine at the business sitting in the afternoon.

Features of the Business Session

The company which Mr. Lafontaine represents are manufacturers of a modified rosin sizing of which paraffin wax is a component part, and the observations and experiences described in his paper were based on reports of the technical staff of the firm. The explanations and hypotheses advanced were stated by him to be personal and open to critical comment and discussion, and he was not disappointed in the response, for a good discussion ensued. In fact the entire time of the meeting was taken up with the paper and its discussion, though Joseph H. Dow, of the Eastwood Wire Corporation, got an opportunity, as a member of the general committee in charge of the forthcoming annual convention of the national association in Philadelphia, to give an outline of the program of papers and mill visitations planned for the meeting.

Plans for Big National Convention

Of special interest was the announcement of a visit to the great color laboratories of E. I. du Pont de Nemours & Company, Inc., Wilmington, Del., as well as an inspection of the plant of the Pusey and Jones Corporation, where steamships are built as well as paper machines. John J. White, who acted as toastmaster at the dinner dance in the evening, supplemented Mr. Dow's remarks and said that plans were being made for one or two special cars to convey members from Holyoke and vicinity to the convention at the Benjamin Franklin Hotel in Philadelphia on May 28. A large turnout of members and visiting superintendents from all parts of the country is expected and everyone was urged to make early reservations for train and hotel accommodations.

Beater Sizing a Complex Problem

In the course of his discussion of beater sizing, Mr. Lafontaine confessed that while the use of rosin for sizing stock in the beater had been practised for upwards of 100 years, the process was still a complex problem and the manner in which rosin acted to make paper resistant to writing fluids was still more or less of a mystery. Many factors were involved, he said, and the study of any one of these would take months of experimentation.

As to troubles encountered in the beater sizing of paper, he said that rosin size was often blamed when the trouble originated in faulty practices or wrong handling of the size. A slight modification of procedure would often correct the situation and eliminate the trouble.

Essentials of Good Sizing—He listed four conditions that should be observed if the best results were to be obtained with any grade of paper or board, as follows:

"1—A well prepared size, adapted to the particular mill conditions;

"2—A thorough dispersion of the size particles in the stock;

"3—A good retention of the precipitated size by the fibers;

"4—A proper fluxing of the rosin or modified rosin through the sheet."

Maintain Uniform Dilution—It was important, he said, to maintain a uniform consistence of dilution in emulsifying the size. A paper mill superintendent who had noticed wide variations from day to day in sizing results made an investigation and found that the concentration of the size showed changes in a two-week period from 1.5 per cent to 3.6 per cent, the average being about 2.5 per cent.

On the question of the best size for any individual mill, the speaker said that this could only be determined by practical experimentation. A 50 per cent free rosin size worked satisfactorily in some mills, while in others, particularly mills using hard water, a neutral size gave best results. Between these extremes there was a wide range to choose from.

Sizing efficiency was dependent in large part on the extent of surface of the individual particles of the emulsified rosin, the covering power of any substance being affected by its state of division. The smaller the individual particles, the greater the covering power.

Faulty Procedure—Many of the errors in sizing were traceable to the procedure followed in adding the size to the stock. Complete distribution of the size throughout the fibers follows in fifteen to twenty minutes after its addition and it need not therefore be added more than half an hour before the beater is dropped. The addition of the size to the stock at too early a stage retards hydration of the fibers and causes a drop in strength of the finished sheet.

Avoid Acid Water—Acidity of the stock should be avoided, hence it was not advisable to use the acid return water from the paper machine to dilute stock in the beater, as premature and local precipitation of the size was apt to occur and cause uneven sizing. It was advantageous, however, to use acid white water in furnishing the beater after the alum had been added to precipitate the rosin.

Neutral Size Best with Hard Water—In explanation of the better results obtained with a neutral size with hard water, Mr. Lafontaine said the theory was that the calcium and magnesium salts contained in hard water react with sodium resinate, and not with free rosin, to form insoluble calcium and magnesium resinates which are said to have no sizing value. It would therefore appear that with hard water, a high free-rosin size should be used in order to reduce the amount of calcium and magnesium resinates formed. According to Mr. Lafontaine, no satisfactory explanation of that apparently contradictory phenomenon was available.

Overcoming Hard Water Trouble—To correct hard water difficulty it was found useful to add a part of the necessary alum before the size, the alum being credited with the properties of a water softener. The worst trouble was experienced with a combination of hard water and high temperature. Thus in the case of a mill using hard water and furnishing the beaters with water from a hot well, where the temperature of the stock varied from 120 deg. Fahr. to 140 deg. Fahr., a deposit of calcium sulphate and size was formed as a scale on the walls of the beater, and this would break off from time to time and become mixed with the stock, filling the paper with black specks. The remedy consisted in eliminating the temperature factor. The size was added after all the alum had been furnished and just previous to the dropping of the beater. As cold water was used at that stage, there was sufficient cooling effect to prevent the size agglomerating and building up on the walls of the beater.

All Fibers Must be in Before Adding Size—The importance of adding all fibers to the beater before the size and alum are added was emphasized by the speaker. When different pulps are used to complete a furnish, it is customary to incorporate them separately during the beating cycle. In such a case it is necessary to see that all fibers are put in the beater before the sizing ingredients are added. If this is not done uneven sizing will result.

Tub-Sized Shavings Lower Sizing Quality—Mr. Lafontaine made the observation that it was difficult to get good sizing results with a stock composed principally of broke or hard shavings that had been tub-sized with animal glue and starch. The addition of 10 per cent of bleached sulphite pulp to make up the beater resulted in a 100 per cent increase of sizing efficiency. A good retention of precipitated size by the fibers was highly essential to satisfactory results.

What Is the Sizing Agent?—The old question was brought up as to whether retention of rosin on the fiber was effected mechanically or chemically. It was mentioned that some people, presumably the colloid chemists, hold that there is an

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electrostatic attraction between the fibers, the alum and the rosin, while others insist that it is a case of mechanical retention only. One thing at least was certain and that is that there must be a definite proportion of alum present not only to obtain good sizing in the paper off the machine, but also to prevent deterioration of the sizing on aging. The correct proportion of alum necessary to produce best results has to be determined by experiment in each case.

Drying Temperatures—Of equal importance with a measured quantity of alum was attention to the steps in drying the paper to obtain a temperature high enough to flux the rosin through the sheet. Less than 200 deg. Fahr. would not be effective, he said.

Experience with a Preheating Dryer—Mr. Lafontaine described some results obtained on a board machine equipped with a preheating dryer between the second and third presses. Better sizing followed a reduction of the water content of the sheet before the board reached the drying stack.

Sizes of Low Melting Points Are Best—Another point brought out by him was that if means are taken to lower the melting point of the sizing emulsion so that it will be fluxed more readily at a given temperature, the sizing efficiency will be increased. That is what happens, he said, when wax is mixed with rosin, the higher the proportion of wax the lower the melting point of the combination and therefore the greater the covering power of the sizing material. He cited laboratory results to demonstrate the relative covering power of various rosins and rosin-wax sizes at different temperatures, which appeared to prove the point. The addition of 19 per cent of wax to a rosin sizing emulsion increased the covering power of the size 100 per cent, while the addition of 38 per cent wax increased it by 300 per cent, on the assumption that the sheet is heated to a temperature of 200 deg. at the last dryer. It is not generally admitted that a temperature of 200 deg. Fahr. is ever reached in the drying of paper, but at prevailing temperatures rosin wax sizes might be expected to show greater sizing efficiency on account of their greater spreading capacity.

Questions Raised in Discussion

A general discussion followed the presentation of the paper by Mr. Lafontaine. A number of rapid-fire questions were directed at him by members, and these he answered in sequence. As to the proper time to add alum to the beater he said that thirty minutes after adding the rosin size would be about right. The beater should be dropped within at least half an hour, as it had been fairly well established that the strength of paper decreases in proportion to the length of time the stock is left in contact with the size. He said that the size should be added as late as possible in the operation. It might even be best to put it in at the jordan or headbox.

Asked as to the reaction that takes place between the milk of rosin and the alum, Mr. Lafontaine gave it as his personal opinion that rosin was set free and that aluminum hydroxide was formed, the sulphuric acid in the sulphate of alumina uniting with the soda to form sulphate of soda which went into solution. Less alum was needed with rosin wax sizing than with rosin size alone. P. J. Kennedy and R. W. Pattison discussed the influence of heat in the beater on sizing efficiency and also the determination of acidity by means of hydrogen ion measurements.

Sullivan Machinery Co., Chicago, announces that it has secured the sales rights for "Tanner-tanks" and "Tannergas" for the prevention of freezing in compressed air lines and at the exhaust of compressed air tools. The device consists of a tank and by-pass piping connected into the air line near the point of use. This tank contains a liquid which forms a gas on combination with the compressed air in the top of the tank. This gas is carried into the air lines, and is the active agent which prevents freezing at the tools.

H. S. Ford, who has been connected with the R. H. Beaumont Co. for the past fifteen years, has become associated with the Bigelow-Liptak Corp. of Detroit. Mr. Ford will be located at 5057 Woodward Ave., Detroit, the headquarters of the company.

New Catalogues, Books and Publications

Alexander Brothers, Philadelphia, Pa.—A circular has just been issued showing the adaptability of Tentacular transmission belt to paper mill drives. Application of this belt to various drives is illustrated in color.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.—Bulletin No. 1643 is devoted to type SSOR paper stock pumps. The pump is illustrated and briefly described. A conversion chart and diagrams are given.

DeLaval Steam Turbine Company, Trenton, N. J.—A number of Canadian pumping stations are described and illustrated in a 28 page leaflet recently issued by this company. There is also a map on which the locations of these installations are indicated. Large scale sectional drawings point out improved features of design in the several classes of centrifugal pumps adapted for water works and industrial service.

Department of Commerce, Washington, D. C.—The Bureau of Standards has issued in pamphlet form reprint from the Bureau of Standards Journal of Research, Research Paper No. 143, entitled "Rayon as a Paper-Making Material" by Merle B. Shaw and George W. Bicking. Copies of this reprint may be had from the Superintendent of Documents. Price 5 cents.

Fairbanks, Morse & Company, Chicago—An unusually attractive book entitled "Beginning the Second Century" has been issued by this Company to celebrate the centennial anniversary of the invention of the platform scale by Thaddeus Fairbanks. The introduction contains a brief history of the founding of the company and the history of the development of weighing machines, and tells something of the accomplishments, aims and aspirations of the company. The second part takes up the age of power, featuring the Fairbanks-Morse Diesel engines. The third chapter is entitled "A New Era of Speed and Accuracy" and takes up some of the many uses of Fairbanks-Morse scales in industry. The book closes with a brief foreword of the century to come.

General Electric Company, Schenectady, N. Y.—The subject of arc welding in industry is covered in a recent booklet released by this Company. The many uses of this process in the fabrication of steel work are set forth and the text is interspersed with a large number of interesting illustrations.

Quigley Furnace Specialties Co., New York City—"Hytempite in the Power Plant" is the subject of a recent publication just issued. This bulletin features the uses of Hytempite cement for boiler settings, baffles, special shapes, repairs, etc. The method of making inclined or vertical monolithic baffles with crushed firebrick and Hytempite is fully described, as well as the use of the Quigley refractory gun for furnace walls and arches and for building and repairing baffles.

Revolvator Co., Jersey City, N. J.—Bulletin 85B depicts the Revolvator and Portelator in action in paper mills and newspaper plants. The revolvable base model is especially recommended for handling material in cramped quarters.

United Conveyor Corporation, Chicago, Ill.—Bulletin 201 gives a brief description of this company's Nuveyor, which is a pneumatic conveyor adapted to convey coal ashes and all dry, granular, abrasive materials.

BOOK REVIEWS

British Paper Mill Directory—The 1930 issue of the **Directory of Paper Makers** of Great Britain and Ireland is now available. The addresses of mills are arranged in alphabetical order according to country, as England and Wales, Scotland, Ireland. There is also an alphabetical list of mills with firm names, as well as a list of mills in counties, with maps showing where mills are operated. The **Directory of Paper Makers** lists London wholesale stationers and gives a classification of makes of paper with the addresses of manufacturers. Under Trade Designations are given watermarks and trade designations used as trade names. Many additions have been made to actual watermarks and trade names since the 1929 issue of the directory. The volume is published by Marchant Singer & Co., 47 St. Mary Axe, London, E.C.3, at five shillings and six pence, to which foreign postage must be added. Those who can make use of a British paper mill directory will find the **Directory of Paper Makers** an accurate and reliable publication.

Accounting for Executive Control—In this book of 495 pages by Monard V. Hayes, published by Harper & Brothers, New York ($6), cost accounting proper, while well treated, takes a subordinate place, the cost accountant being relegated to a minor position in the comptroller's department. The matter of "Expense Accouning" versus "Standard Costs" is discussed and fairly weighed in favor of standard costs. The book is likely to prove of great value to executives as well as to accountants—the executives will learn from it what to expect from their accounting department and accountants get a better understanding of their duty and opportunities in a modern indusrial organization. Problems of management and the nature of accounting are discussed prefatory to a consideration of types of organization and the accountant's relation thereto. The student of accounting is taken behind the screens to see how directors, the president and other officers of a corporation function, so as to enable him to appreciate better what is required of him as regards the preparation of records and reports.

The method of marketing control in relation to sales and publicity is adequately treated and there are chapters on procurement control and labor control. Special problems, such as analysis, use of external statistics and business forecasting, receive consideration, and there is a chapter on the budget which is illustrated in detal by a specimen budget carried through for several years. The book is one that can be recommended for study by paper mill executives as well as by accountants.

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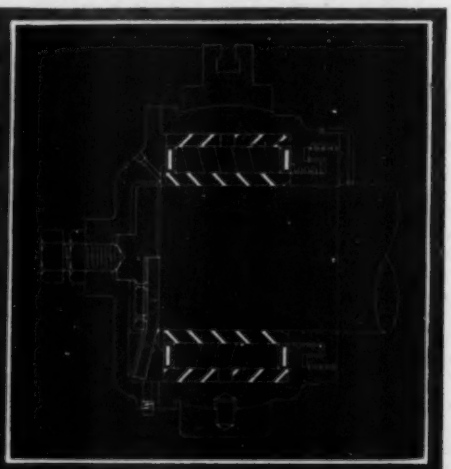

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The Month at Washington

A NEW tariff bill will probably be handed down by the Congressional solons before the end of the month. The conferees have submitted their report and the whole issue is principally up to the Senate. The House has allowed the Senate amendments to paperboard, wallboard, pulpboard, cardboard and leatherboard, processed and unprocessed, to stand, while the Senate conferees allowed the House provision for a countervailing duty on uncoated printing paper. The Senate amendment increased from 25 to 30 per cent the rate of duty on manufactures of pulp, and the House has agreed to this amendment.

The House bill imposed compound rates of duty on papers commonly or commercially known as tissue paper, and on certain other papers enumerated in par. 1404, according to weight per ream. The Senate amendment makes certain that the duties imposed shall apply to such articles whether white or printed, and the House recedes from its position.

Under the House bill india and bible paper, weighing 10 pounds or less than 18 pounds to the ream is dutiable at 4 cents per pound and 15 per cent ad valorem. The Senate amendment makes such paper weighing between 18 and 20½ pounds per ream also subject to this rate, and the House has agreed to this amendment.

In the House bill, paper wadding and pulp wadding, and manufactures of such wadding are not specially mentioned but are classified as crepe paper at the rate of 6 cents per pound and 15 per cent ad valorem. The Senate amendment specially enumerates such articles without change in rate, and the House recedes on its position.

The House bill imposed a duty of 20 per cent ad valorem upon plain basic paper ordinarily used in the manufacture of paper commonly or commercially known either as blue print or brown print, and plain basic paper ordinarily used for similar purposes; and a duty of 25 per cent ad valorem on sensitized paper commonly or commercially known either as blue print or brown print, and similarly sensitized paper; and a duty of 5 per cent ad valorem on unsensitized basic paper, and baryta coated paper, to be sensitized for use in photography; and a duty of 30 per cent ad valorem on sensitized paper to be used in photography. The Senate amendment strikes out these duties and substitutes a duty of 3 cents per pound and 10 per cent ad valorem on plain basic paper for albumenizing, sensitizing, baryta coating, or for photographic processes by using solar or artificial light; and a duty of 3 cents per pound and 20 per cent ad valorem on albumenized or sensitized paper or paper otherwise surface coated for photographic purposes. The Senate recedes from its position.

The House bill imposed a duty on paper envelopes, not specially provided for. Senate amendment 710 provides that these duties shall apply whether the envelopes are filled or unfilled, and whether the contents are dutiable or free; and amendment 711 further provides that when the contents of such envelopes are subject to an ad valorem rate of duty based in whole or in part upon the value thereof, the envelopes shall be dutiable at the rate applicable to their contents, but not less than the rates provided for the envelopes. The House has receded its position on both amendments.

The House bill imposed a duty of 30 per cent ad valorem on filtering paper. The Senate amendment changes this rate to 5 cents per pound and 15 per cent ad valorem, and the House recedes, allowing the Senate amendment to stand.

Senate amendment No. 714 reduces from 30 to 20 per cent ad valorem the rate of duty imposed by the House bill on uncoated and undecorated cover paper, and the Senate has receded from its position.

With the paper schedule the Senate will have but little trouble, and an early enactment would become possible, but the tale does not end here, hence the difficulty.

Bills in Congress—The Trade-Mark bill (H.R. 2828) passed by the House is now being considered by the Senate, and may shortly be passed, as are the following postal bills (H.R. 7395) to extend to government postal cards the provision for defacing the stamps on government stamped envelopes by mailers; H.R. 8650 to authorize the Postmaster General to charge for services rendered in disposing of undelivered mail.

The following bills have been placed upon the Senate calendar for action: S. 3060, to provide for the establishment of a national employment system and for co-operation with the States in the promotion of such a system; S. 3272 to authorize the despatch from the mailing post office of metered permit matter of the first class prepared at least 2 cents but not fully prepaid, and to authorize the acceptance of third-class matter without stamps affixed in such quantities as may be prescribed.

Postal Rulings—The Postmaster General announced that the rules relating to the acceptance of metered mail matter of the first class and of the fourth class, had been liberalized. The Department, it appears, is desirous of having the use of metered mail extended so far as possible within practical limits and to this end certain restrictions have been removed.

First-class mail, according to the new ruling, may be deposited in designated lots of not more than 300 pieces and dropped in any collection box, and fourth class mail irrespective of the number of pieces or whether or not they are identical, will be accepted at post offices from persons or concerns who have been accorded permits to mail fourth-class matter as metered permit mail.

As a result, metered mail will become available to a great number of users who have heretofore found it impracticable to deposit their mail at post offices or who, because of the previous restrictions in respect to fourth-class mail, have found the metered devices not adaptable to their requirements.

Envelopeless Letter—Invention of a new device to make an "envelopeless letter" has been called to the attention of postal officials. The new device was said to be designed by George Dunagin, in charge of the U. S. Bureau of Agricultural Economics, Atlanta, Ga. His device is attached to an electrically operated folder, and as the letters run out of the machine they come out folded and sealed with mucilage so that no container is necessary, but the sealing is in such a manner that the letters are not defaced by opening. Tests made at the Atlanta post office were pronounced a success.

Advantages of Labeling—The Director of the Bureau of Standards in a recent statement points out four distinct advantages of quality labeling of merchandise:

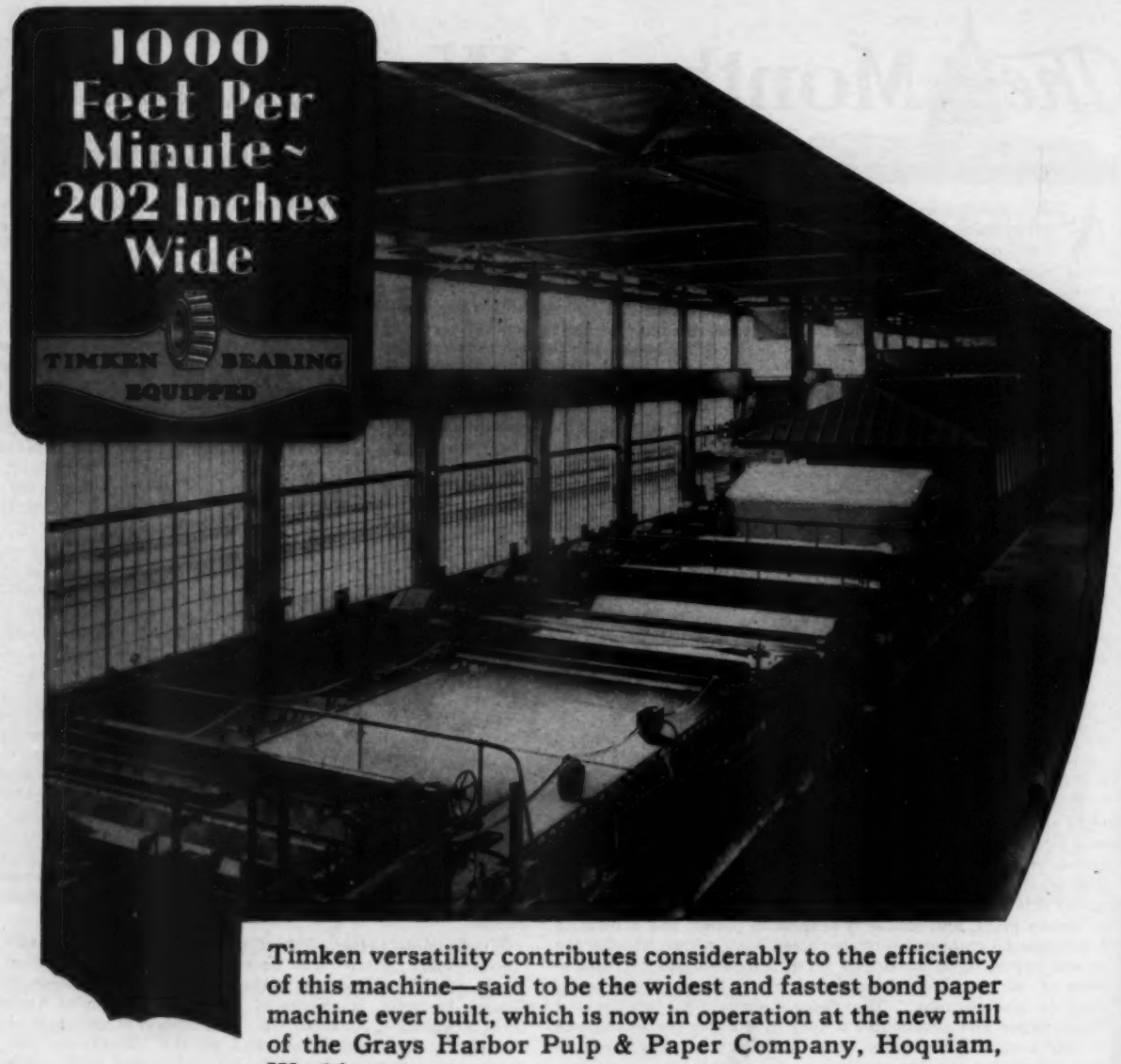
1. It helps manufacturers and dealers to obtain maximum benefits from mass production, distribution and consumption of such commodities;

2. It encourages the small-quantity buyer to purchase staple goods that are guaranteed to comply with such specifications;

3. It gives individual consumers as well as organized producers the benefit of tests and investigations preliminary to the formulation of nationally recognized specifications;

4. It encourages firms to manufacture goods to comply with or to exceed specification requirements, and facilitates the buying of specification made goods.

Business Executives Warned—In a recent statement, the surgeon general of the Public Health Service, issued a warning against irregular eating by business executives, pointing out that haste at mealtime and improper diet are causing increased digestive disorders. He points out that statistics show that in recent years there has been a marked increase among business men of this country particularly, in ailments



Timken versatility contributes considerably to the efficiency of this machine—said to be the widest and fastest bond paper machine ever built, which is now in operation at the new mill of the Grays Harbor Pulp & Paper Company, Hoquiam, Washington.

The machine was built complete by The Bagley and Sewall Company with the exception of the removable Fourdrinier which was built by the Beloit Iron Works.

Every roll is Timken-equipped, for not only is it necessary that friction be reduced to its lowest terms, but shafts and gears must be held to micrometer precision, radial and thrust loads must be carried with a wide margin of safety, dependability must be assured, operating and maintenance costs must be forced to lowest limits . . . and it takes the exclusive combination of Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS* and Timken-made steel to meet and master all of these requirements.

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TIMKEN *Tapered Roller* **BEARINGS**

affecting the stomach and digestive organs. The majority of these cases result from the American habit of doing everything, including eating, in a rush. If the American business man would use common sense in his daily habits as often as he does in his commercial activity, there would be far less dyspepsia, indigestion and ulcerated stomachs, he said.

Commercial Survey of New England—The 3 volumes of the "Commercial Survey of New England," issued by the Department of Commerce, present data which taken together give a detailed picture of that section of the country as a producing area, as a consumer, and of the trade mechanism which brings the diversified output of manufacturing establishments of that and other regions to its concentrated population. The complete series is now available for purchase from the Superintendent of Documents, Washington, D. C.

Employment and Payrolls—The Bureau of Labor Statistics reports a decrease of only 0.6 per cent in employment in various manufacturing industries in April as compared with March, and an increase of 0.1 per cent in payroll totals. With 1926 as the basis of 100, we find the following changes recorded for:

	Employment			Payroll totals		
	1929	1930		1929	1930	
	April	Mar.	April	April	Mar.	April
Paper and printing	100.1	101.0	100.8	106.4	106.3	106.5
Paper and pulp	95.0	96.1	95.6	98.4	99.2	98.5
Paper boxes	92.6	90.9	90.6	101.3	95.3	96.3

Wholesale Prices—The recession of wholesale prices, which began last August, continued into April with a further decline of 1 2/5 per cent, according to statistics released by the Department of Labor. With 1926 as the basis of 100, we find the following changes for paper and pulp:

April 1929	March 1930	April 1930	Purchasing power of the dollar in April, 1930
87.8	87.0	87.0	114.9

National Retail Credit Survey—The Domestic Commerce Division has just issued its report on its findings on eight groups of stores in connection with its national retail credit survey, setting forth the experience of these establishments on such subjects as credit terms, credit losses, the use of credit bureaus, collections, etc., to serve as a guide for individual business men who can benefit by comparing their own experiences with that of others.

Economic Crises—The commission recently suggested by President Hoover to study economic crises would not attempt to direct economic life in the United States, but would be a body to make an examination of the experiences of the country during the recent slump, it was stated orally at the White House. It would make studies similar to those made in reference to the 1919 and 1920 boom and slump. Those studies had a most important effect, it was stated, amounting to a crystalization of ideas and a spread of understanding which entered very largely into our economic life since that time.

Check Up on Simplified Practice—To determine the degree of adherence of various industries, to their simplified practice recommendations, periodic surveys of production are being conducted by the Division of Simplified Practice in conjunction with the standing committees of the respective industries. Two recent surveys disclose an 83.7 and a 96.5 adherence. Many constructive suggestions as to further eliminations from and additions to the simplified lists of sizes were also received.

Curing Labor Ills—Ethelbert Stewart, Commissioner of Labor Statistics, recently announced that fewer hours and more work is the best prescription to cure labor ills, and that if industry discarded old ideas and concentrated more on output rather than on hours of labor, it would react to the benefit of all concerned.

Stabilizing Production and Employment—Practical measures by which American industries are stabilizing production and employment, and reducing seasonal and cyclical fluctuations, are summarized in a report on "Balancing Production and Employment Through Management Control," recently issued by the U. S. Chamber of Commerce.

Paper Mulch—Paper mulch trials conducted during the past year continue to give promising results with a large number of crops, says the Department of Agriculture. Paper mulch first came into generaly use in this country in 1928, and the initial sales of mulch paper for that year were limited by the manufacturers to a few rolls per person, but were nationally distributed and amounted to enough to cover 500 acres, most of it being used in home gardens. As a result of these trials there was a remarkable extension of the application of paper mulch in 1929 with an estimated acreage of 5,000 acres. The actual cost of the paper varies widely, depending upon the quality of paper used and the system followed in mulching. With the usual practice the cost of paper is about $35 per acre. Crops which indicate possibilities of profitable production with the use of paper mulch are tobacco, sweet corn, melons, tomatoes, peppers, cauliflower, onions, celery, lettuce and some other vegetables. Trials also indicate that paper mulch may prove profitable with nursery stock, fruit and nut trees, vine crops, and bulbs and flowers. Besides increasing the yield, the use of paper mulch has been found in a number of cases to improve the quality of certain crops. In flower production larger blooms and longer stems result; in tobacco production the number and size of the middle standards in certain types of leaf results. The use of paper mulch for weed control points a way to weed eradication also. Thus is opened up quite unexpectedly a new and very extensive market for paper, which those first in the field will naturally harvest.

Paper Plant Argentina—A plant for the manufacture of paper, using wheat and linseed straws as a raw material, will be erected in the near future near Rosario, Argentina, in Juan Ortiz, and "papel de obras" extensively used as a book and writing paper will be produced, also wrapping, wall and other papers, which do not enjoy "free trade" but have tariff protection.

Recent Publication—The Department of Commerce has recently put out miscellaneous publication No. 70, "Glossary of Terms Used in Fire Control." Forest fire control is one of the major activities of the American forestry movement. The vocabulary used in this work has been largely unfixed and a matter of locality. This work is an attempt to establish a uniform terminology in fire control, and although still incomplete it will be recognized as a medium by which to express many of the complex elements of forest fire control.

Leaflet No. 57, "Pulp-Wood Crops in the Northeast" has been prepared by M. Westveld, Silviculturist, Northeastern Forest Experiment Station, Branch of Research, Forest Service, maintained in co-operation with the Massachusetts Agricultural College.

Technical Bulletin No. 166, "Timber Growing and Logging Practice in the Northeast prepared by Samuel T. Dana, formerly director of the Northeastern Forest Experimental Station Forest Service, presents measures necessary to keep forest land productive and to produce full timber crops. The introduction is by William B. Greeley, formerly forester, of the Forest Service.

U. S. Civil Service Examinations

The United States Civil Service Commission announces the following open competitive examinations: Assistant Scientific Aide, $1,620 a year; Junior Scientific Aide, $1,440 a year.

The examinations are to fill vacancies in the Department Service, Washington, D. C., including the Bureau of Standards, and in positions requiring similar qualifications. Applications must be on file with the Civil Service Commission at Washington not later than June 10.

Optional subjects for the position of assistant scientific aide are advanced general physics, ceramics, chemical engineering, chemistry, civil and mechanical engineering, electrical engineering, paper technology, physical metallurgy, physics and chemistry, and textile technology. For the position of junior scientific aide, lists of eligibles will be established of those qualified in physics, those qualified in chemistry, and those qualified in both physics and chemistry.

Full information may be obtained from the U. S. Civil Service Commission, Washington, or the Secretary of the U. S. Civil Service Board of Examiners at the post office or customhouse in any city.

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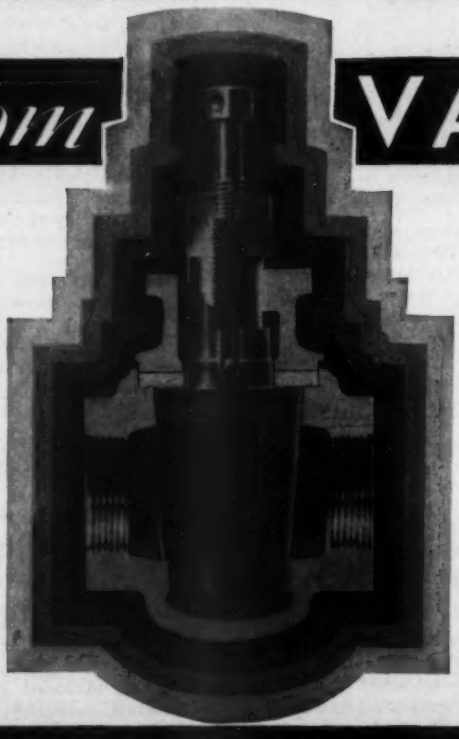

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Buffalo: Genesee Building Detroit: 2042 W. Grand Blvd. 550 South San Pedro St. Masonic Temple Building San Francisco: 333 Sansome St.

AGENCIES IN PRINCIPAL CITIES

Factories: Oakland, California and Belleville, New Jersey Canadian Manufacturers: Peacock Bros. Ltd., Montreal, Cobalt, Winnipeg, Vancouver
England: Audley Engineering Co., Ltd., Newport, Shropshire Buenos Aires, Argentine: General Electric Soc. Anon. Victoria 618 Esq. Peru

◆ NEW YORK CITY ◆

International Shows Big Deficit

The annual report of the International Paper and Power Company shows earnings for 1929, after all prior charges and deduction of depreciation reserves, of $4,011,762 for the preferred and common stocks of the International Paper and Power Company, substantially the same as the $3,949,206 realized for the same stocks in 1928. The ability of the company to maintain its earnings in view of the fact that the price of newsprint paper in 1929 in such typical markets as New York and Chicago averaged $5.50 per ton below the price in 1928 is a measure of its progress during the year. The earnings of the company showed progressive increases each quarter during 1929, earnings for the last three months being much larger than for any of the previous quarters.

For the full year 1929 the earnings available for depreciation and for dividends on the shares of the International Paper and Power Company amounted to $13,151,264. Total dividend payments amounted to $8,834,511 (preferred dividends, $6,447,651, and Class A common dividends, $2,386,800), and depreciation to $9,139,502, leaving a deficit for the year of $4,822,148.

The organization of the International Paper and Power Company and of the International Hydro-Electric System, the power and utility holding company for the group, have made it possible to broaden substantially the scope of the company's operations in the utility field. The broadened scope is indicated by the fact that out of total capital assets with a book value of $661,001,400 as of December 31, 1929, $410,-610,283, or over 62 per cent, represented power and utility properties and investments. At the present time practically two-thirds of the consolidated net earnings available for interest and reserves are being derived from power and utility operations.

The consolidated balance sheet shows that at the end of 1929 net current assets exceeded $56,000,000, while the ratio of current assets to current liabilities was nearly four to one. Neither the company nor any of its subsidiaries had any bank loans.

In 1929, the extensive paper and pulp development program commenced in 1925 was substantially completed. During the period the capacities of the Three Rivers newsprint and Kipawa sulphite mills were doubled, and three additional newsprint mills in Canada and Newfoundland and five kraft mills in the Southern States were erected or purchased.

Expresses Opinion on Status of Paper Industry

The paper industry in the United States is badly demoralized by a large excess of productive capacity over the normal consumption, according to a statement by Charles R. McMillen, president of the Union Bag & Paper Corporation, of New York. Mr. McMillen holds that until this fact is recognized by the industry generally and the companies are guided by it there is little hope for permanent improvement in industrial profits for any one concerned.

Discussing the situation with regard to kraft paper, he declared producing capacity exceeds consumption by about 35 per cent. The annual productive capacity in this field alone is 1,100,000 tons, while the consumption in 1929 of kraft paper was 750,000 tons.

"More than $50,000,000 is invested in the production of kraft paper for which there is no current need to supply demand," said Mr. McMillen. In a similar way he indicated that newsprint production capacity is 25 per cent over the demand, and that the investment kept idle is $200,000,000. Mr. McMillen stated that the Union Bag & Paper Corporation had been suffering from these conditions in the industry generally.

John J. MacKay, who for seven years has been associated with the department store firm of Lord & Taylor, of New York, in various executive capacities, resigned as of May 1 to become vice president of Eaton, Crane & Pike, stationery manufacturers, of Pittsfield, Mass., and New York City.

The Spencer-Wynne Paper Products, Inc., of New Windsor, N. Y., against whom a petition in bankruptcy was filed recently, has filed schedules showing liabilities of $487,859 and assets of $783,372, consisting mainly of land, mill and machinery, subject to a mortgage executed in favor of the Guaranty Trust Company as trustee as security for a bond issue of $250,000.

Charles C. Davis

Charles C. Davis, president of Davis & Holly, Inc., stationers of 200 Fifth avenue, New York, and widely known in the paper industry, died suddenly at his home in Pelham Manor, N. Y., April 7. Mr. Davis, who had recently returned from a month's vacation in Barbados, was 57 years old. After having been a vice president of Eaton, Crane & Pike, stationers, of New York, for a number of years, Mr. Davis organized his own firm last year. He was vice president of Whiting & Cook, Inc., paper manufacturers of Holyoke, Mass., and director of several banks. A widow, a daughter and three sons survive.

Alfred S. Nalle, formerly New England agent of the Southern Division of the International Paper Company, and also previously sales manager of the Hummel-Ross Fibre Corporation, of Hopewell, Va., is now associated with the West Virginia Pulp and Paper Company, of 230 Park avenue, New York, assisting in the distribution of the kraft papers manufactured in the Covington mill of that company.

At the annual meeting of the Johns-Manville Corporation, New York, manufacturer of roofing paper and other products, all retiring directors were re-elected, and at the organization meeting of the directors which followed all officers were re-elected for the ensuing year.

New Forestry Building Assured

The New York State Legislature has appropriated $600,000 for a new Science Building for the College of Forestry at Syracuse University. The new structure will be erected on the campus of the university and will afford opportunity for research that heretofore has not been possible in the forestry program at Syracuse.

The new building will contain an herbarium and a modern greenhouse together with an insectary where insects destructive to forest trees may be studied. The Roosevelt Wild Life Station will occupy one floor and the departments of forest pathology, forest botany, dendrology, technology and entomology will also be supplied with more room for laboratory and classroom work.

William L. Glatfelter

William L. Glatfelter, president of P. H. Glatfelter Company, paper manufacturers, Spring Grove, Pa., died suddenly from a heart affection at his winter home in Pinehurst, N. C., on Sunday, April 20. His only son, Philip H., was at his bedside when he died, having been hastily summoned from Spring Grove when his father's condition took a turn for the worse.

William L. Glatfelter was born in Spring Grove, April 27, 1865. He received his education in the York County Academy, Pennsylvania College at Gettysburg, and Eastman's Business College at Poughkeepsie, N. Y. After leaving the latter institution, Mr. Glatfelter entered the office of the Spring Grove paper mills, of which his father was the founder.

The deceased was prominently identified with a number of different enterprises in Spring Grove and York, Pa. He had been president of the P. H. Glatfelter Company for about a quarter of a century. In addition to his interest in paper manufacture, he was a director in the York Ice Machinery Corporation, and was also president of the Hanover Wire

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Cloth Company. He was president of the First National Bank, Spring Grove, from the time the bank was organized in 1902.

The late Mr. Glatfelter took an active interest in the affairs of the community, and had received the honor of election as president of the school board, and later as chief burgess of Spring Grove. Besides his other activities, he was celebrated as a stock raiser, being the owner of the Old Forge Dairy Farms on which he bred and raised many prize-winning Jersey and Ayrshire cattle.

Mr. Glatfelter is survived by his wife, son and three sisters, besides five grandchildren.

Francis Downs Manning

Francis Downs Manning, vice president and chairman of the board of Farrel-Birmingham Co., Ansonia, Conn., passed away April 9, at Derby, Conn., at the age of fifty-seven.

After graduating from Yale in 1894, Mr. Manning entered the employ of the Birmingham Iron Foundry. Beginning in the engineering department he entered the business end of the company in the capacity of secretary, continuing in close association with his father its marked progress and success. When the Farrel Foundry and Machine Co. merged into the Farrel-Birmingham Company, he was chosen vice president and chairman of the board, continuing in the latter position until his death. Mr. Manning was an active figure in civic and community circles. He is survived by his widow and three children, also his mother and father.

Doctor Drewsen Has a Birthday

Dr. Viggo Drewsen, chief of the consulting research staff of the West Virginia Pulp & Paper Company, had a birthday celebration on Sunday, April 13, at his home, 5 Cherry Avenue, Larchmont, N. Y. Born in Denmark in 1858, he is now in the seventy-third year of his age, as alert mentally as he has ever been. It will be recalled that on the occasion of his seventieth birthday the Verein der Zellstoff-und Papier-Chemiker u.-Ingenieure made him an honorary member of the association. An account of this was given in the issue of THE PAPER INDUSTRY for July, 1928, in connection with an account of Doctor Drewsen's lifework and career. Doctor Drewsen's best known contribution to scientific pulp manufacture was a method for the recovery of SO_2 during the cooking process for the manufacture of sulphite pulp. He comes of an old family of papermakers and the tradition is maintained, for his son, Pierre, a member of the Technical Association of the Pulp and Paper Industry takes high rank as a chemical engineer in pulping processes. He is a graduate of the Massachusetts Institute of Technology and is noted as a student of the higher mathematics and problems related thereto. He is at present director of the chemical department of the Hinde & Dauch Paper Company, Sandusky, Ohio, where he makes his home.

Crane Co. to Establish Museum

A monument to the papermaking industry in this country is being established in New York City by Crane & Company, paper manufacturers with mills at Dalton and Westfield, Mass. This is in the form of a museum which is designed to preserve documents, engravings, maps, specimens of paper, currency and papermaking tools bearing on the early history of Crane & Company, and the inauguration of the papermaking industry in Massachusetts.

A stone building constructed in 1846, standing among a group of modern paper mills, has been restored and adapted by Charles S. Keefe, a prominent New York architect. It will house the collection. The surrounding grounds are being landscaped to make a garden spot on the bank of a river which winds picturesquely among the mills. Carl C. Curtiss, of the American Historical Bureau, New York, has been selected to organize the museum.

The Crane family has been identified with papermaking for more than 150 years.

SOUTHERN

Another Mill for the South

The International Paper Company is reported to have contracted for a paper mill to be erected at Panama City, Fla., at a cost which it is said will ultimately exceed $10,000,000 where kraft paper will be manufactured.

The plant will be located on a tract of 150 acres bought by the city and leased to the company. The site faces Bay Harbor and is adjacent to the large plant of the St. Andrew's Bay Lumber Co. The mill will be of concrete, steel and brick, and will have two paper machines, each 236 inches in width, of the most modern design. It is proposed to erect another two-machine unit as soon as the first is completed, so that the capacity of the mill can be increased from 200 to 400 tons a day.

A 15,000 kw. electric generating plant to furnish power for the mill and to supply a surplus to the Gulf Power Co., which operates in the Panama section, is a part of the present program. The plant is expected to consume 800 cords of wood daily. The project will also involve the construction of between 200 and 300 workers' homes.

Work has begun on the first building unit in the expansion program of the Bogalusa Paper Co., Bogalusa, La., according to R. H. Laftman, general manager of the company, who announced that contract for the work had been let to Dye and Mullings, Columbia, Miss. It is expected that the buildings will be completed and machinery installed by September 1.

National Paper Products Sales Co., Inc., of Reno, Nev., has been chartered to operate in Louisiana, with no assets listed in the state.

Lake Griffin Pulp & Paper Co., Leesburg, Fla., recently incorporated under the laws of Florida, plans the construction of a $1,500,000 paper plant at Leesburg with half a dozen other mills proposed for various sections. The newly formed company, headed by Mary J. Cassady, has applied to the Florida Internal Improvement Fund, of which Governor Carlton is chairman, for exclusive use of 30,000 acres of state-owned saw grass lands for production of paper pulp to be converted into newsprint paper. Lillian Hemlin is vice president of the company, and C. E. Duncan, secretary.

Farmers of Louisiana received $1,650,589 from the sale of pulpwood from their farms during 1929, according to figures compiled by the agricultural extension service of Louisiana State University. This sum was paid by six pulp and paper mills of the state to farmers in 13 parishes. The amounts spent by individual concerns ranged from $24,000 to more than $800,000. Many farmers of the state with these splendid markets at hand are beginning to grow timber as a crop, according to Robert Moore, extension forestry specialist.

The D. & W. Paper Co., Inc., has been formed at New Orleans, La., with a capitalization of $150,000, to engage in merchandising paper goods. Jules Wolbrette is president of the company with Samuel H. Marcuse, secretary treasurer.

An amendment to the charter of the Southern Paper Co., Ltd., New Orleans, La., fixing the capital stock at $150,000, has been granted.

A representative of a large pulp products' company is reported to have conferred with power and industrial officials at Vicksburg, Miss., over the possibility of establishing a pulp plant in that city utilizing cottonwood and willow. The area around Vicksburg is believed to have an adequate supply of raw materials to justify the establishment of a wood pulp plant if other conditions stand up under investigation.

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WISCONSIN

Conditions in the Industry Favorable

Conditions continue reasonably sound in the paper industry of Wisconsin, and in fact new announcements of improvements and expansion give credence to the favorable outlook ahead. One receivership has been announced, but the difficulties bringing it about are not of recent origin.

Construction has been started by the Flambeau Paper Co., Park Falls, on a large new dam at Crowley Rapids, on the Flambeau river, according to Guy Waldo, manager. The dam will impound a 19-foot head of water, two water wheels, and a brick power house and operating quarters. More than 100 men will be employed all summer on the project. Power supplied from the Pixley dam, four miles further along the river, was not sufficient and the company decided on further water power in lieu of enlargement of the steam plant. The Pixley dam has four water wheels and a 21-foot head of water.

Twenty-five per cent greater finishing capacity will result from improvements in progress at the tissue division of the Marathon Paper Mills Company at Ashland. An addition is being built to the finishing division 100 by 120 feet in size, one story and basement, and of brick and concrete. Another addition 55 by 28 feet will be built for office purposes. Six new finishing machines will be installed, according to Henry Josephs, manager. The company will push the production of embossed bridge sets, consisting of table cover and four napkins to match. Present production of folded crepe napkins is now 7,500,000. Paper production will continue on the same capacity basis. The basement of the building will be used for storage and a machine shop. The office unit will be equipped with steel furniture throughout and a large fireproof vault will be included. About 30 employees will be added when the new facilities are ready.

In order to gain maximum power benefits, the Mosinee Paper Mills Company will rebuild its dam on the Wisconsin river at Mosinee, Wis. The dam will be enlarged and the level will be raised. A permit has been granted by the Wisconsin Railroad Commission.

Improvements also have been quite extensive at the Munising Paper Co., Munising, Mich. A new office building 54 by 64 feet and finished in brick gives attractive executive quarters on the first floor, and ample space in the second story for accounting, engineering, displays and superintendent's quarters. The old office quarters will be made a part of the finishing room, where more space was needed because of the growing demand for Caslon bond and other products advertised extensively by the company. The annual production of bleached sulphite is 26,000 tons, used mostly in the Munising plant. Fifty-two thousand cords of pulpwood represents the annual consumption.

At Menasha, Wis., the Allan Paper Company is putting up a two story building 60 by 120 feet in size. This is a new concern dealing in waste paper. The first floor will be used for receiving and storage, and the second floor for assorting and baling.

A new building 60 by 76 feet in size is being built by the Edgewater Paper Co., Menasha, jobbers at a cost of $20,000. The city of Menasha has exempted this building from taxes for five years as a means of encouraging the expansion.

Although the Tomahawk Pulp and Paper Co., Tomahawk, Wis., tried for sometime to work out of difficulties reported to have been caused by cancellation of business, a receivership finally was found necessary. The Wisconsin Valley Trust Company has been appointed in this capacity by the circuit court of Lincoln county. C. B. Pride and sons own the mill. A shutdown was ordered several months ago and about 90 employees were laid off. Just when the plant will be started up again is problematical. Creditors have been notified to file claims by Dec. 17, 1930 and a hearing is scheduled for Jan. 5, 1931. The First Trust Company, of Appleton, requested the receivership.

Continue to Oppose Change in Freight Rates

Aid of the International Paper Company and the Wisconsin Paper and Pulp Manufacturers Tariff Association have been extended in the fight waged by the Central Freight Association and the Southeastern and Southwestern carriers to wipe out the present freight rates from Wisconsin to the south and west. The latest proposal is to replace commodity rates with class rates, and a protest was made at a recent meeting of 300 shippers in Chicago. Class rates of the Central Freight Association are now involved in hearings before the Interstate Commerce Commission, it is pointed out, and there is no telling now what the final rates will be.

The International company objects to re-opening what is known as the Minnesota and Ontario case and the Fox paper case, because it is claimed that this merely is an attempt to take the matter out of the hands of the Interstate Commerce Commission and place it with the carriers. These cases were the means of establishing satisfactory rates eight years ago. Comparisons have been included in the brief to show that rates on newsprint and wrapping paper are not "ridiculously low" as claimed. They are shown to be higher on a basis of mileage to New Orleans than those from the New England territory. New England pays 38½c for 1,000 miles to Chicago, while Wisconsin shippers pay 43½c for 1,080 miles to New Orleans.

American Forestry Association

Pulpwood demands of paper mills are helping to solve the serious problem of millions of acres of cut-over and burned-over lands in Wisconsin, Michigan and Minnesota, it was learned from the address by Dr. Raphael Zon at the convention of the American Forestry Association at Minneapolis last month. As director of the Lake States Experiment Station, he told how Jack pine and popple are among the first trees to grow in these areas, and if their use could be general, this would be one way of meeting the problem of tax delinquency. These areas represent a total of 20,000,000 acres. This section once had 85,000,000 acres of virgin forest, but the lumber industry has swept it away. These lands cannot be used for agriculture, and reforestation therefore helps to meet the economic problem. The automobile has made people appreciate and enjoy the woods and lakes also, it is pointed out, and the income from this industry has been of inestimable value.

William Mauthe, chairman of the Wisconsin Conservation Commission, also spoke urging increased state and federal aid for reforestation. He told of six areas covering an equivalent of two ordinary counties now definitely set aside for state forests. These will be known as: the Brule river forest in Douglas county; Thunder Mountain district in Marinette and Oconto counties; Flambeau river district in Sawyer county; Vilas and Oneida county district; central district, including parts of Jackson, Clark, Monroe, Wood and Juneau counties, and Kettle Morain district, in Fond du Lac and Sheboygan counties. The state now owns most of these lands.

All necessary steps have been taken by the United States Government to establish the Moquah federal forest in Bayfield county and ceremonies were held recently when it was declared such. Work was started immediately by Donald C. Ball, federal forester, on the planting of 500 acres of trees. Three-hundred thousand white pine and Norway seedlings are to be used. Just when work was to start, a serious fire broke out in the forest but was stopped by 100 rangers before it did much damage. Rains since then have minimized fire danger.

K-C Elects Officers

In the reorganization of the Kimberly-Clark Corporation, Neenah, Wis., due to the death of Harry Price, secretary treasurer, Charles H. Sage of New York City, was elected to the board of directors, and C. A. Sommers was made treasurer. Election took place at the annual meeting of stockholders. Other officers and members of the board are: F. J. Sensenbrenner, president; Ernst Mahler, S. F. Shattuck, John S. Sensenbrenner and William Bonifas, vice presi-

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dents; S. R. Stilp, C. B. Clark, J. C. Kimberly, Frederick Warburg, Melvin L. Emerich and Walter Kasten.

The company has found it necessary to make another enlargement of its offices by remodeling the fourth floor of its experimental mill. The entire accounting department will be moved to this section.

Wisconsin's new $900,000 building for the United States Forest Products Laboratory seems a certainty because of the passage of the appropriation by both houses of congress. The president's signature on the bill is awaited. Land has been given for the building by the state on the University of Wisconsin campus at Madison, where the present laboratory is located.

Considerable improvement in the fourdrinier wire industry in the Fox River Valley is expected following the approval of a 50 per cent tariff. Local manufacturers put up a hard fight to equalize the situation with foreign competition, because most of the plants have been operating at part time for a long period. A senate demand for 40 per cent and a house demand for 55 per cent resulted in a conference decision of 50 per cent. Manufacturers say the average cost of production in American plants is 47 cents per square foot, not including selling cost and profit, and even with the 50 per cent tariff, foreign wires will be laid down in New York at 37 cents a square foot. The actual tariff needed is contended to be 80 per cent.

Northwestern division of the Pulp and Paper Mill Superintendents Association met Saturday, May 10, at Wisconsin Rapids. The morning was spent at mills of the Consolidated Water Power and Paper Co., and the Nekoosa-Edwards Paper Co. A luncheon was held at noon, followed by a golf tournament. In the evening a banquet was held at Bull's Eye Country club with George W. Mead, president of the Consolidated as speaker. A question box on problems of the industry followed.

Harry Fletcher Lewis has been engaged as professor of organic chemistry at the Institute of Paper Chemistry at Lawrence college, Appleton, Wis. He formerly was research chemist for the Analine Chemical Co., of Buffalo, N. Y. Lawrence college also will attempt a seminar on "Human Relations in Industry" in evening sessions next winter so as to teach students to offer solutions to problems as well as to gather facts. S. F. Shattuck, vice president of the Kimberly-Clark Corporation, will be chairman of the seminar.

Fire damage of $15,000 was caused recently at the Grandfather Falls Paper Co., Merrill. A portion of the roof was burned away. Operations had to be suspended for several days.

Safety records of the Consolidated Water Power and Paper Company show that there were 16 lost time accidents in the first quarter of 1930 as compared to 27 during the same period in 1929. There have been two fatal accidents in the state during the last month. Gustav Fritschler was electrocuted at the Tomahawk Kraft Paper Co., Tomahawk, when a steel girder he was assisting to hoist contacted a live wire. Michael Kalka was killed at the Wisconsin River Paper and Pulp Co., Stevens Point, when a truck backed him against a brick wall.

L. M. Alexander, president of the Nekoosa-Edwards Paper Co., Nekoosa, has been named as national councillor of the American Paper and Pulp Association to the Chamber of Commerce of the United States. He spoke at the annual chamber meeting recently on "What's Ahead for Business."

The city of Peshtigo, Wis., has ended its differences with the Badger Paper Mills, Inc., by granting a $200,000 reduction in tax assessment of real estate.

George W. Mead, president of the Consolidated Water Power and Paper Co., has been elected to his third term as mayor of Wisconsin Rapids, his home city. He returned recently from Miami Beach, Fla., where he purchased a new summer home last winter.

Frank J. Sensenbrenner, president of the Kimberly-Clark Corporation, Neenah, has had architectural plans completed for a $500,000 home to be built on a country estate on Lake Winnebago, several miles east of Neenah.

The estate of Harry Price, late secretary and treasurer of the Kimberly-Clark Corporation, is estimated at $500,000. Outside of a bequest of $10,000 to Theda Clark hospital, Neenah, $10,000 to St. Thomas Episcopal church, Menasha, and $5,000 to Grafton Hall, a girls' school, the entire estate goes to his family.

Cost Meeting

A meeting of the Wisconsin Division of the Cost Department of the American Paper & Pulp Association will be held at Essex Lodge, Tomahawk, Wis., on Saturday, June 28. A Program Committee consisting of A. F. Kletzien, F. W. Jallings and Walter Howard was appointed at the last meeting of the division, to draw up a program for the meeting.

Harry Deyo, of the Nekoosa-Edwards Paper Company, Port Edwards, Wis., was elected president of the Wisconsin division for the forthcoming year, and Miss I. M. Carney was again elected secretary of the division. Those intending to attend the meeting on June 28, should send their reservations to Miss I. M. Carney, care of Tomahawk Kraft Paper Company, Tomahawk, Wis., so that suitable reservations may be made at Essex Lodge.

Judging from the success of the meeting held last year, at the same time and place, a most instructive and enjoyable meeting will be arranged, and the secretary will welcome reservations from representatives of all mills, both member and non-member.

◆ OHIO ◆

"Televox" Demonstrated to Miami Superintendents

The Miami Valley Division of the American Pulp and Paper Mill Superintendents' Association met at the Hotel Manchester in Middletown, Ohio, Saturday, April 26.

R. H. Maxwell, engineer of the Westinghouse Electric and Manufacturing Company gave a talk and demonstration of the electrical man, the "Televox." The "Televox," although only two years old, has been applied to many control applications and the future is unlimited. The speaker demonstrated that Mr. Televox is so highly trained that it will answer the telephone, listen to its master's voice and then execute the commands. It will light and extinguish a light, start and stop an electric fan and vacuum cleaner and perform various other startling operations.

The construction of Mr. Televox is unusual. His veins are copper, bones porcelain, with binding posts for ears and hard rubber for skin. He obeys his master more faithfully than many modern servants.

The electrical man's name, "Televox," means "Distant Voice," and distance has no effect on the faithful observance of commands by the device. The operator may be in San Francisco and the "Televox" in Cuba, yet the apparatus will operate just as readily as if directed from the same room.

The "Televox" is not a toy or an engineering curiosity, but an electrical slave which was created to meet very definite industrial requirements, such as the control from a distance of the machinery in unattended, automatic electric power substations. Three electrical men are already working 24 hours a day, with no vacation, watching the height of water in three reservoirs in Washington, D. C.,

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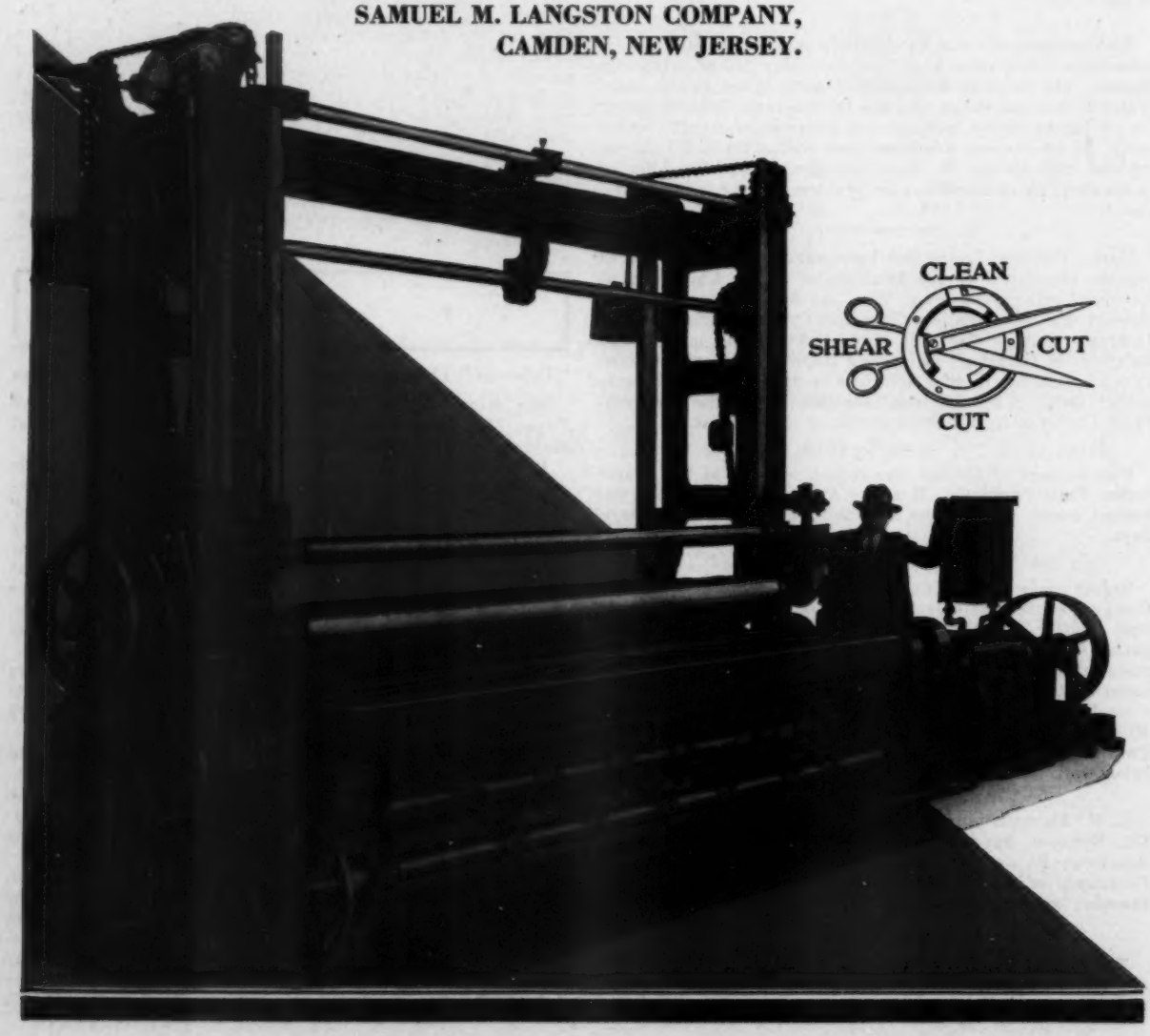


reporting by telephone to the War Department whenever called upon to do so.

The next meeting of the Miami Valley Division will be held June 14th, at the Hamilton Inn, Franklin, Ohio.

The speaker selected for the June meeting will be Mr. Glass of the Tolhurst Machine Works, Troy, N. Y., who will discuss the Tolhurst Centrifugals, manufactured under the Erkensator (German) patents.

American Interest in North European Paper Industries

Growing Danger of Raw Material Shortage

(From a Correspondent)

Helsingfors, Finland

THE report from New York that American publishers are beginning to look to the European paper industries for increased supplies of newsprint and that American capitalists are prepared to make long-term investments for expanding the paper production of the North European countries, has, so far, not attracted much attention in these parts. Even in interested industrial circles the prospect of large American capital investments seems to be meeting with but scanty interest, and it is understood that the project was not even discussed at the recent international meeting of paper manufacturers in Hamburg.

It is apparent that the North European paper manufacturers are inclined to regard this proposal of the American newsprint consumers merely as a tactical move in their tug-of-war with their own and the Canadian paper industries, and they seem to be loath to let themselves be drawn into an issue, the outcome of which is very obscure. It also seems rather strange that such propositions should be introduced at the time when paper prices are exceedingly low and paper concerns even with highly efficient productive methods find it difficult to make satisfactory returns.

On the other hand, it is understandable that newsprint consumers in America are realizing the latent danger of a shortage of raw material, and recent official statements in Canada, including the speech from the throne of Mr. Taschereau, at Quebec on January 15th, seem to have brought home to American publishers the risk of delaying counter-measures too long. Viewed from the New York horizon, European resources of raw material may look very considerable, but apart from the forests in Russia, European supplies are at present hardly large enough to allow any greater increase in paper exports to the United States. In order to substantiate this fact, a short survey of pulpwood resources in Europe may be of interest.

European Pulpwood Resources

The modern paper industry is based on the forest resources of the Northern hemisphere where large areas of coniferous woods are to be found. Spruce is the most important raw material used by the paper manufacturers, and the growth in consumption of paper has resulted in increasing economic prosperity in many of these forest growing countries. At present, Canada leads in the production of newsprint, whereas Sweden holds first place in the manufacture of chemical wood pulp. Norway and Finland have also flourishing paper and wood pulp industries with steadily increasing export figures. Although the abundant supply of raw material has enabled these countries to expand their paper industry in a very remarkable manner, they cannot claim a monopoly, either as regards their raw materials, or within the industry itself. They are, namely, up against a very strong competition from several other industrial countries, both such as have forest lands within their own boundaries as well as those which are partly dependent on imports of pulpwood from other sources.

In recent years, the question of pulpwood exports and imports has assumed an international aspect, in that it has created a certain tension between the wood-producing and the wood-consuming countries. Relations between the United States and Canada in this respect are too well-known to need comments; while Germany's large imports of pulpwood are attracting a steadily increasing attention. So far, the raw material requirements of the German paper industry have been mainly satisfied by imports from Poland, Finland and Czechoslovakia. For a long time these countries were quite willing to supply Germany with their surplus output of pulpwood which was not claimed by their own paper industry. But with the increased consumption of the home timber resources, partly amounting to excessive exploitation and with the progressing expansion of the home paper industry, these countries have become more and more reluctant to feed the German paper industry, especially as Germany has built very high tariff walls against imports of ready-made paper and wood pulp, and, moreover, has established a very keen competition, particularly with Finland, in the international paper market.

Forest conditions in Finland, Norway and Sweden are, thus, of a special importance for the whole European paper market. Norway has already reached the point where her own forests have ceased to satisfy the requirements of her paper mills, so that imports of wood pulp have become necessary. Sweden, on the other hand, is still in a position to fill her own needs for pulpwood, thanks to her well managed forests. But Finland, which has proportionately less spruce forests than her western neighbors, is watching with growing anxiety the considerable export of Finnish wood pulp to Central Europe. The Finnish Board of Forestry has recently published the result of an official survey of the country's timber resources, showing that the forests in the southern parts of the country are already subject to excessive exploitation. This means that the country cannot afford to continue indefinitely the export trade of pulpwood without running the risk of gradually creating a serious timber shortage for her home paper industry. Already for some years past the value of pulpwood has been continuously advancing in Finland, while on the other hand the finished article has become cheaper in the world market.

Forest conditions in Poland and Czechoslovakia are hardly better than in Finland, as also in these countries there is a certain amount of excessive consumption, and it is therefore very probable that a protective policy will also eventually be adopted in these timber exporting states. Apart from the countries mentioned in the foregoing, the Central European timber industries can rely on only one other important source of supply, viz., Russia.

The Russian forests contain a high percentage of spruce and it is obvious that exports from Russia, for a long time to come, would suffice to keep the Central European paper industries going. It is, however, extremely doubtful whether, during the present Soviet regime, exports of wood pulp from Russia can be established on a secure basis, and it is in any case hardly advisable for foreign paper industries to erect new mills which for their output are dependent on Russian raw material.

For the time being, at any rate, the European paper industry seems to be faced with a difficult raw material problem which will have to be solved before the manufacturers can hope to increase the output very much beyond its present level. This problem is being discussed not only in manufacturing circles; the League of Nations has recently appointed a special committee to investigate raw material supplies for the paper industry as well as tariff questions relating to the interests of this trade.

Ross and Waldron Move Chicago Offices

The J. O. Ross Engineering Corporation, specialists on Heating, Ventilating and Drying for pulp and paper mills exclusively, and the John Waldron Corporation, a century-old firm of paper converting machinery builders, announce the removal of their Chicago Branch offices from 208 West Washington street to 201 North Wells street.

Both the Ross and Waldron corporations maintain offices at 122 East 42nd street, New York and 519 American Bank Building, Portland, Oregon, the New York office being the main office of the J. O. Ross Engineering Corporation. The Main office and Works of the John Waldron Corporation is located at New Brunswick, N. J.

BUYERS PRICK UP THEIR EARS WHEN SALESMEN ANNOUNCE CENTRIFINED PAPER . . . . .

Buyers know what Bird Centrifiners do to paper stock. When salesmen announce Centrifined paper, they know what they are going to see — paper that is really clean, virtually free from the specks that breed dissatisfaction and complaints.

Would you care to see your competitors be the first to bring out Centrifined paper? Let us give you the complete story on Bird Centrifiners: how they work, how they increase sales, how they build profits.

BIRD MACHINE COMPANY
SOUTH WALPOLE ★ MASSACHUSETTS

*Manufactured under license from the Centrifugal Engineering and Patents Corporation, owners of the Erkensator patents.

BIRD MACHINERY

NOW YOU CAN MAKE PAPER THAT IS REALLY CLEAN . . .

USE BIRD CENTRIFINERS

4026

MICHIGAN

The Michigan division of the American Pulp and Paper Mill Superintendents Association held its monthly dinner session April 17th at the Columbia hotel. The address of the evening was given by Walter Glass of the Tolhurst Machine Company, Troy, New York. His subject was "Tolhurst Centrifugals." This device is used in paper mills for the purification of paper stock.

J. R. Spoor, Superintendent of the King division of the Allied Paper Mills was granted a patent this month for a paper slitter.

A quarterly dividend of 22½ cents a share will be paid April 30 on the 300,000 outstanding shares of common stock of the Sutherland Paper Company, according to L. W. Sutherland, president. This dividend is payable to stock of record as of April 24. Earnings for the quarter were shown to be $81,014 as against $40,000 for the corresponding quarter of 1929. It was further reported at the directors, meeting that the business of the company is excellent and prospects for the future bright.

Motorists passing on U. S. 27 will be able to view day or night curious appearance of two acres of land covered with paper mulch in the Rasey Glad Gardens near Charlotte, Michigan. Alex Rasey, proprietor, secured such good results with ten miles of mulch paper last season that he is extending its use to two acres this spring and installing electric lights for the benefit of passers-by.

Karl F. Hein, assistant chief engineer at the Kalamazoo Paper Company, has been awarded an engineer's handbook for having received the greatest number of points in the educational and efficiency campaign directed among stationary and power engines of this city during the winter. The award was made at the banquet Thursday evening, April 24th, that marked the end of the campaign, when members of local No. 12 of the National Association of Power Engineers gathered at the Columbia hotel.

Why Mail Is Lost

The moving season is again with us. More than half a million changes of address were filed with the Chicago Post Office during the past year, according to Postmaster Arthur C. Lueder, but there were many thousands who moved who did not notify the post office, with the result that many pieces of first-class mail and parcel post remained undelivered and great quantities of circular matter and newspapers were returned or destroyed.

If you move, notify the post office, GIVING THE OLD AND NEW ADDRESSES. Blanks for this purpose may be obtained from the carrier, or an ordinary post card or letter may be used. Roomers should have mail addressed in care of the person whose name appears upon the mail box.

Subscribers to newspapers and magazines should immediately notify the publisher of a change of address so that they may continue to receive their publications without interruption. The old, as well as the new, address should be furnished in every instance.

The General Electric Company has announced, effective immediately, price reductions of from 3 per cent to 5 per cent covering various standard lines of electric apparatus. These reductions were made as a reflection of the recent recession in the price of copper.

Program of Interstate Meeting of the Cost Association of Kalamazoo Valley and the Paper Technologists Club

Kalamazoo, Michigan, May 23 and 24, 1930

FRIDAY, MAY 23rd

10:00 A. M. **Registration** . . . No Fee

1:00 P. M. **Luncheon and Joint Session**
. . Harry Bradford, Presiding
Brief Remarks—Cost Association
. . . George K. Ferguson
Technologists Club . Elbert G. Milham
Safety as a Factor in Reducing Costs
. . . . . J. A. Purdy

2:30-5:00 P. M. **Sectional Meetings**

COST SECTION Norman Cowie, Chairman	TECHNICAL SECTION V. G. Hinemueller, Chairman
"Insurance" — Harris J. Mowry	"Corrugated, Pressed or Shredded Pulp?"—Roger J. Egan
"Making Management Think" Geo. P. Ellis	"Proposed Method for Determination of Water Soluble Materials in Finished Paper" —Th. C. Bentzen
"Depreciation"—H. C. Bradford a. Plant Ledger b. Lapsed Schedule	"Some Recent Jordan Experiments"—G. S. Brazeau
	"Proximate Analysis of Technical Men"—R. G. MacDonald

7:00 P. M. **Informal Banquet**
. E. F. Whittington, Presiding
Toastmaster—George Maye
Music and Entertainment
Principal Speaker—Alfred Greene

Saturday, May 24th

8:00-11:30 A. M. **Mill Visits or Golf**

12:30 P. M. **Luncheon and Joint Session**
. . W. K. Kidder, Presiding
Relation of Cost and Technical Men to the Production Man . R. A. Hayward

2:30-5:00 P. M. **Sectional Meetings**

COST SECTION Glen Ingling, Chairman	TECHNICAL SECTION Carl Schneider, Chairman
"Planning and Budgeting Future Costs and Sales" — Frank Brown	"What Responsibility Should Chemist Have in the Inspection of Finished Paper"—Max Bardeen
To be announced — T. J. Burke	"Testing Paper for Permanence"—Jessie Minor
Question Box	Question Box

6:00 P. M. **Dinner Meeting** E. G. Milham, Presiding
Toastmaster—Carl Handy
Music and Entertainment
Speaker—Harry C. Howard

Eastern Standard Time Prevails. Please be Prompt.

Call in a Specialist

Methods and machinery change. New problems come up year by year in the paper industry and specialists in all departments are solving them. But there is one item that is all too often neglected. Plant lubrication is important and the developments in this field have more than kept pace with changes in the industry.

The cost of lubricants is a relatively small item. It doesn't make a great deal of difference whether you pay more or less per gallon or per pound—but the influence of effective lubrication, on power costs, labor and repairs, is substantial.

The Texas Company since its inception has been a leader in the study of lubrication. Its engineers have a vast fund of facts and experience. They are specialists in lubrication engineering, versed in all its phases. This knowledge is valuable—and it is freely available to paper mill executives on request. You are invited to write The Texas Company at any time on any question of lubrication.

TEXACO

TEXACO

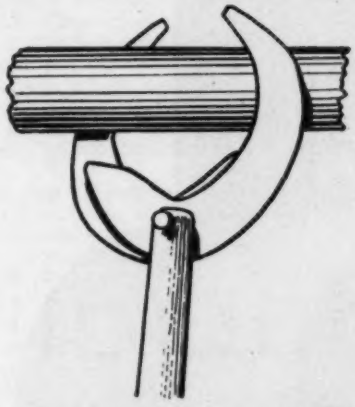
THE TEXAS COMPANY
135 East 42nd Street, New York City

LUBRICANTS

Practical Helps for the Mill Man

Pipe Measuring Calipers

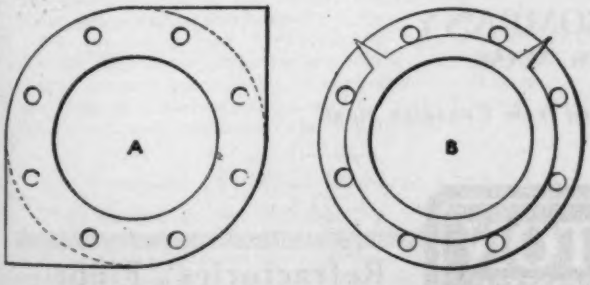
AN interesting device for measuring overhead pipes was described by H. Moore in the March 4, 1930 issue of Power. It consisted essentially of a pair of firm-joint calipers pivoted to a long rod. The calipers were made of sheet metal and were designed by each leg extending beyond the joint in the manner illustrated. When the calipers are opened,



the extensions form a Vee. In measuring the size of an overhead line of piping, it is necessary to open the calipers by hand. The calipers, raised by the handle, are adjusted to fit the pipe by simple upward pressure. No tapping is required to obtain adjustment as in the case when setting ordinary calipers. The calipers are closed by pressing the leg extensions forming the Vee against the pipe, and are opened by a pressure on the points against the pipe. The device is simple, and certainly eliminates the ladder so necessary to reach the pipes if measured in the ordinary way, as well as minimizes the accident hazard.

Steam Gasket Installation

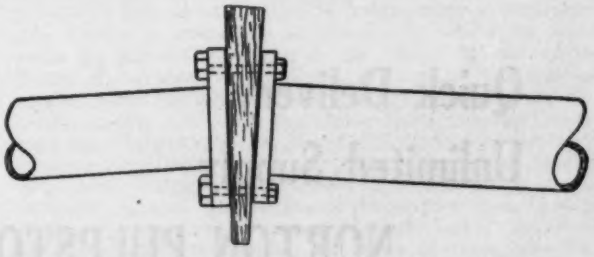
A METHOD for making proper steam gasket installations was described by W. S. Whiting, Jr., in the March 25, 1930, issue of Power. According to Mr. Whiting, a typical incorrect method of installing gaskets on a steam pipe companion flange is illustrated in Fig (A) of the accompanying sketch, while Fig. (B) illustrates the proper method. A gasket is cut from a large piece covering the entire flange face



and the bolt holes punched, if the method illustrated by Fig. (A) is employed. In this case, flange bolts are pushed through the gasket, and hold it in correct position, until the other flange is bolted fast. If the method illustrated in Fig. (B) is employed, a gasket is cut of a diameter not greater than the inside tangent circle of the bolt holes with two small ears extending slightly beyond the outside of the flange to permit location. It is simply necessary in placing this gasket to line up the bolt holes, slip in half of the bolts around the bottom, slide the gasket with the help of the ears to guide it into position between the flanges, and then tighten a few bolts sufficiently to secure it from slipping. Following this operation, the remaining bolts may be placed into position and the entire flange properly tightened. Mr. Whiting states that the unit pressure which may be produced by the bolts on gasket (B) is more than double that of gasket (A), and the chance for rupture under high pressure is considerably reduced. In addition to its greater effectiveness is the advantage of saving in the gasket material.

Temporary Angle Joint Gasket of Wood

EVERY pulp and paper mill uses large quantities of pipe in process work. Frequently it is necessary to make pipe changes over the week-end or even during the week. Naturally, interruptions to service must be kept to a minimum. This elimination of lost time requires ingenuity. A novel scheme of making a temporary angle joint gasket in a low pressure line was described by A. P. Nutter in the April 1, 1930, issue of Power Plant Engineering. On one occasion, he states that it was necessary to install a pump and run an 8-in. pipe line around several obstructions. Time and fittings were scarce, and it became necessary to connive a means of making up the last joint which was found to be decidedly out of line. Measurements of the open connection were taken at the

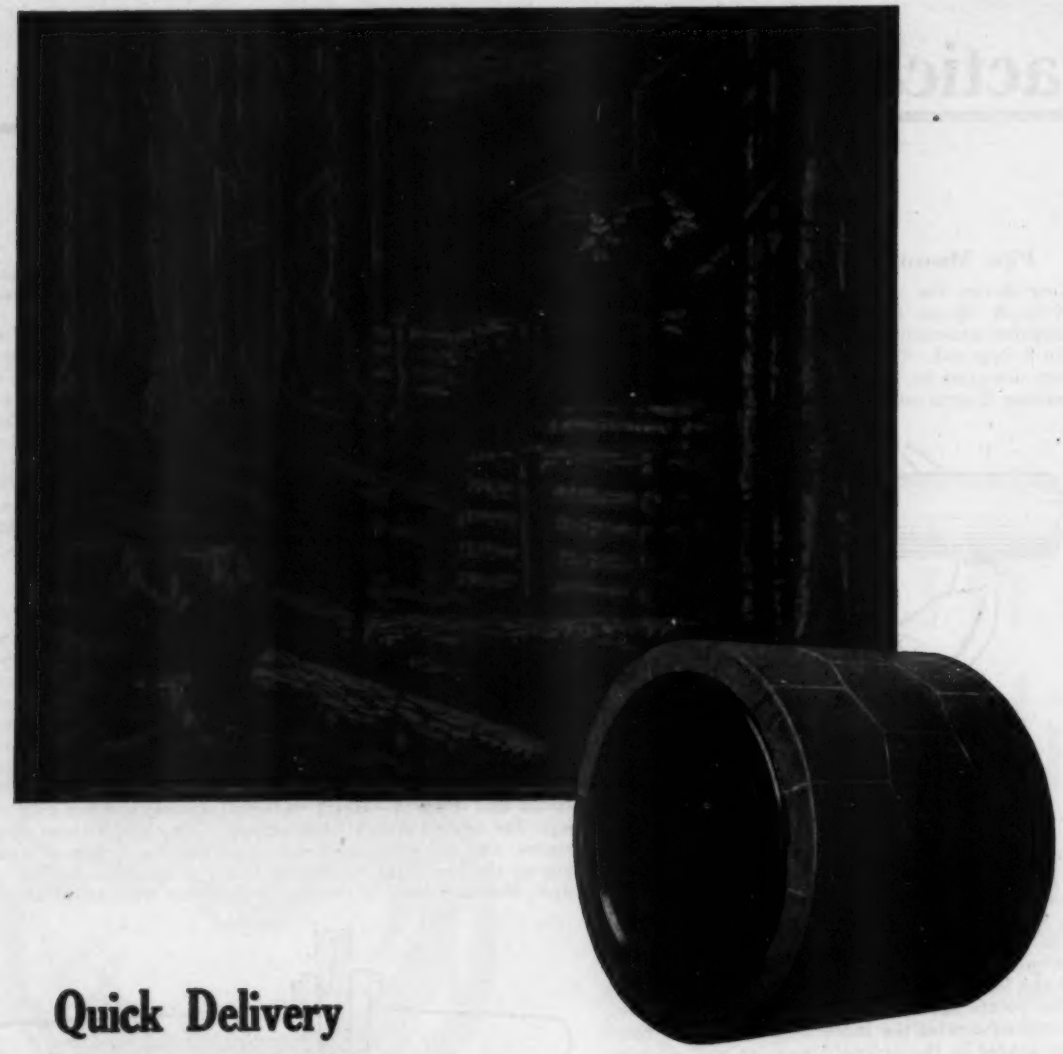


top and bottom openings and wide shingles selected and assembled to give the required dimensions. These shingles were then fastened together, and a hole, the size of the internal diameter of the pipe, was sawed out with a scroll saw. Bolt holes were drilled, and then the gasket placed into position. The tendency of splitting the shingles, when the drill holes were made, was eliminated by backing up the shingles with a board.

Thrust Bearing for Jordan Motor

VERY often standard sleeve bearing motors, connected through sliding couplings, are used for jordan drives. In screwing in the jordan, the friction in the coupling will transmit sufficient force through the motor shaft to the outer motor bearing to wear, and quite often ruin the bearing. This difficulty may be overcome by the addition of a roller or ball thrust bearing to the outer end of the motor shaft.

Hammermill Paper Co., Erie, Pa., announces the appointments of The Alling & Cory of Cleveland, Ohio and New York City, also Chicago Paper Co., Chicago, Ill., as Hammermill agents.



Quick Delivery
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NORTON COMPANY
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Canadian trade now supplied from Canadian plant

Grinding Wheels
Grinding Machines

NORTON
PULPSTONES

Refractories - Floor
and Stair Tiles

Canadian News

Stabilization of Newsprint Price

At its annual convention held in New York in the last week of April, the American Newspaper Publishers' Association adopted a resolution approving the principle of a broad economic stabilization of production and distribution of newsprint over a period of years. The convention, however, left the price to be paid for newsprint at any time in the future as a matter to be determined by each individual publisher. This followed from the program laid down in the following letter from John H. Price, Chairman of the Newsprint Institute of Canada, to the Paper Committee of the A.N.P.A.:

"In accordance with discussions at our meetings on the 17th and 18th of March, I am now authorized by the member companies of the Newsprint Institute of Canada to submit to your committee, for transmission to the members of the A.N.P.A. at their annual convention, the following program. As I indicated at the meeting, this is done in an effort to stabilize the price of newsprint paper, and to meet the position in which both manufacturers and consumers find themselves.

"I believe that in putting forward such a program, due account has been taken of the economic condition surrounding our respective industries, and although it may not entirely meet the views of either industry, it represents a constructive and fair program which is conceived to be in the interests of both:

1—The price of newsprint paper for the remainder of the year 1930 will remain at the present level.

2—The price of newsprint paper for the year 1931 will be $2 per ton in advance of the 1930 level, present freights allowed.

3—The price of newsprint paper for the year 1932 will be $2 per ton in advance of the 1931 level, present freights allowed.

4—The price of newsprint paper for the year 1933 will be $1 per ton in advance of the 1932 level, present freights allowed.

"A fair scale of differentials for colored and special papers will be provided.

"All the above prices are quoted for three and a half year contracts, taking effect from the 1st of July 1930.

"In presenting this program to your members, you will, I trust, think it proper to tell your members that the Canadian industry has taken a fair, sane and economic view of the situation. It is essential to the welfare of the industry that manufacturers should secure the confidence and co-operation of their customers, and I hope that the conference we have already had will convince you of their determination to be constructive, economic and fair.

"The member companies expect that under the closer relationship, which it is hoped may exist between publisher and manufacturer in the future, the purchase of institute mills' paper will be encouraged.

"In conclusion may I express our appreciation of the friendly and co-operative attitude which your committee displayed towards our industry at our recent meetings, and also the hope that such meetings may be more frequent in the future and have equally satisfactory results."

Proposed Pulpwood Embargo Opposed

The Canadian Pulpwood Association held a three-day conference recently at Ottawa, at which legislation, both Federal and Provincial, in connection with the pulpwood business was discussed. Angus McLean, of Bathurst, presided. At this gathering, the outcome was a vigorous denunciation of the proposal of Georges Parent, M.P. for Quebec West, to have an embargo placed on all pulpwood cut from private lands in Canada. A resolution urging such a step is on the order paper of the House of Commons at Ottawa, and is expected to come up for discussion sometime during the present session. Considerable dissatisfaction was also voiced in connection with the Pulpwood Conservation Act, passed by the Ontario Legislature in 1929, and more particularly with section six of this act which was stated to be beyond all reason and to be detrimental to farmers, settlers and small lumber operators in the province.

In connection with the Parent motion, a special meeting of the Chamber of Commerce of Port Arthur, Ont., was held last month. The gathering was attended by representatives of a number of concerns engaged in the export of pulpwood from the Thunder Bay district, and a resolution of opposition to any proposed embargo was passed. A copy of the resolution was sent to D. J. Cowan, M.P., asking him to oppose the proposition when it comes up for discussion. It was pointed out that any abrupt interference with the pulpwood industry would seriously affect employment and curtail the earning capacity of farmers and settlers whose wood is purchased by the export companies. Discussing the situation, W. R. Wood, of Toronto, well-known in pulpwood circles, said: "Russia has the largest pulpwood forests in the world and the United States itself the second largest. Last year a cargo of Russian pulpwood was landed in the United States in competition with our own, and it requires only some such move as an embargo on Canadian wood to switch over to Russia and other countries the bulk of this whole export business with the United States—a business worth more than $20,000,000 annually, employing 50,000 farmers, settlers, and lumber jacks in season."

Important Freight Rate Case Started

Newsprint manufacturers and newspaper publishers are pitted against the Canadian and United States Railways in a fight to prevent an increase in freight rates on newsprint. The dispute is proceeding simultaneously before the Interstate Commerce Commission in the United States and the Board of Railway Commissioners in Canada. The increase sought by the railways amounts to roughly 25 per cent. The tariffs putting into effect the higher rates were filed sometime ago at Ottawa, but the Board of Railway Commissioners suspended application of the new rates. The present hearing is to decide whether that suspension shall be lifted, as the railways contend. United States newspapers from Chicago eastward to the Atlantic seaboard and throughout the South are concerned in the enquiry, and some of them have filed complaints against the lifting of the suspension.

The Canadian Railways' position is that the newsprint mills and the United States newspapers endeavored in the first place to control Canadian freight rates by means of the Interstate Commerce Commission of the United States and thereby to reduce Canadian rates to the detriment of Canada. The railways contend that the present rates are lower than the average on all other freight. They declare that for sometime past they have felt that the existing rates were not satisfactory, that they had borne with the low rates in an effort to develop the industry but propose now to conclude that policy and that the rates were too low as compared with export rates or with local rates on shipments for Canadian consumption.

Declaring that 85 per cent of Canada's newsprint production and 80 per cent of its pulp production are exported to the United States, the Canadian Pulp and Paper Association, representing 23 Canadian mills, has filed a brief claiming that the Canadian industry is seriously affected by the present alleged discrimination by carriers between Canadian and United States paper and pulp companies. It is contended that the shipment of Canadian pulp and newsprint to the Southern States has been virtually ended by reason of this

Briner Economizers

LICENSED UNDER PATENTS OF E A BRINER AND JOHN E ALEXANDER

that were PAID for though never ordered!

Too many mills during the past winter, paid a staggering price for the vast quantity of steam that was required to heat their machine rooms. Considering the saving that could have been effected through the operation of Briner Economizers, supplying most of the required heat by reclaiming it from waste vapor —at negligible cost—it is simple to understand how these mills paid for Briner Economizers that they did not install. Each year, more and more mills install Briner Economizers—as an investment.

Let our engineers start now to help you cut costs in your mill this coming winter. Fall installations for operation before cold weather sets in again should be planned now. Consulting us puts you under no obligation.

J. O. ROSS ENGINEERING CORPORATION

201 North Wells Street
CHICAGO

Main Office—122 E. 42nd Street
NEW YORK

519 American Bank Bldg.
PORTLAND, ORE.

ROSS ENGINEERING OF CANADA, LIMITED

NEW BIRKS BLDG., MONTREAL

ROSS SYSTEMS

HEATING—VENTILATING—DRYING

alleged discrimination, whereby United States producers get lower rates on hauls from United States which are no longer in mileage than the hauls from Canadian points. On this score, the Canadian manufacturers are not only opposing the proposed rate increases but are urging reductions from the existing scale. Declaring that some of the Canadian paper mills now are working on half time or less, that prices are the lowest since the war, the association asserts that the newsprint industry now is in "a precarious condition. Since the prospect is for a continuance of these conditions for an indefinite period, the industry is in no position to stand an increase."

The hearing has been adjourned to May 12.

The summer meeting of the Technical Section of the Canadian Pulp and Paper Association will be held at Ottawa on Thursday and Friday, June 12th and 13th. A special business program will be provided on Thursday and visits to the pulp and paper mills in the district are scheduled for Friday. Further details will be announced later.

Heavy Forest Fire Losses

Complete figures for the year 1929 show that the season was one of the worst ever experienced as regards forest fires, despite the development of fire-fighting methods by federal and provincial authorities. During the year 6,685 fires were reported in Canada. With the exception of 1922, this is the largest number of fires for any year on record. The area burned over was 6,029,749 acres, of which approximately two-thirds was non-forested. The total gross damage and loss is estimated at $6,202,495.

The portions of the Dominion chiefly affected consisted of an area extending from Western Ontario to the Pacific Coast. This area experienced very little snowfall during the winters of 1927-28 and 1928-29. During the spring and summer of last year there was almost a complete lack of rain, and this condition combined with extended periods of high winds served to create an unparalleled condition of extreme drought throughout Western Canada, and fires, once started, spread rapidly over large areas.

The following table compiled by the Forest Service, Department of the Interior, Ottawa, from returns made by the different forest authorities, gives in detail the figures for the year 1929 as compared with the average for the five-year period 1925-29, inclusive:

Item	Year 1929	Average 1925-1929
Total area burned over (acres).....	6,029,749	2,319,074
Total number of fires.....	6,685	5,146
Merchantable Timber		
Area burned (acres).....	674,226	376,223
Timber burned (M. B. M.).....	508,715	455,125
Timber burned (cords).....	2,005,366	1,634,821
Estimated stumpage value.....	$2,379,946	$2,532,868
Young Growth		
Area burned (acres).....	1,023,111	531,836
Estimated value	$2,004,759	$1,013,925
Cut-Over		
Area burned (acres).....	324,965	172,161
Estimated value	$285,569	$130,002
Non-forested		
Area burnt (acres)	4,128,901	1,275,283
Other property burned		
Value	$301,499	$441,883
Actual cost of fire fighting.....	$978,120	$630,624
Total gross damage and loss.....	$6,202,495	$4,800,029

Canadian Mills Operating at Low Rate

During March the Canadian newsprint mills operated at 68.4 per cent of their rated capacity, as compared with 80.3 per cent for the United States mills and 98.5 per cent for the Newfoundland mills, and produced 207,485 tons. The shipments amounted to 208,629 tons. During the first three months of the year, the Canadian mills have produced 15,706 tons, or 2 per cent, less paper than during the corresponding period of last year.

With the prospects for increase in the price of newsprint during the latter half of the year becoming more dim owing to the falling off in consumption, further mergers are looked forward to as providing the more practical solution of the problem of how to place the industry on a more profitable basis. Two consolidations of major importance are now spoken of as definite possibilities: one is the amalgamation of the Abitibi Power and Paper Co. with the International Paper Co., and the other is amalgamation of the St. Lawrence Paper Mills, the Brompton Pulp and Paper Co., and the Lake St. John Power and Paper Co. That the Canada Power and Paper Co. will figure somewhere in the new line-up is taken for granted, and although rumors are conflicting, there seems to prevail a feeling that announcements along the lines indicated will come in the near future.

There is evidently no means of obtaining any definite information in this connection, as any negotiations which may be taking place are naturally veiled with great secrecy. In this connection, however, it may be interesting to note the productive capacities of the four largest Canadian producers, which are as follows: Abitibi 2,200 tons per day, Canada Power and Paper 1,944 tons, Canadian International Paper 1,700 tons, and Price Brothers 936 tons. The figures for Canadian International Paper do not include the newsprint output of the E. B. Eddy Co., of Hull, Que., in which International is understood to have an interest. If this is added, it brings International's figure up to 1,820 tons per day, and the total of the four companies up to well over 7,000 tons per day, leaving only about 4,000 tons capacity for all the other mills.

According to Gerald A. Newman, assistant trade commissioner for Canada in Liverpool, the British market is one of the most important outlets for all kinds of wall board. In 1929 wall board to the value of 250,000 pounds sterling was imported from the United States alone. Canada is represented in this market by several well-known producers, two of whom began doing business in England on a large scale during the past year. While there are as many as sevent-five different brands being advertised in the United Kingdom, the firms of major importance are about ten in number.

❖ QUEBEC ❖

An order-in-council has been signed by the Lieutenant Governor providing that no change will be made in the rate of the ground rent charged to timber limit holders. The last change was made in 1920, for a period of ten years, which according to the order-in-council passed then ended on the 1st of May. The rate then had been raised from $5 to $8 per square mile, representing a considerable increase in the rent. The order-in-council as passed, however, in the present case is understood to extend the present rate for a period of one year so that instead of a revision taking place in 1940 there may be alterations next year. The reason for the present stand taken by government is said to be the outgrowth of the existing situation in the paper industry.

Report Reflects Economies in Pulp Operation

A decline as compared with the preceding year is shown in the operating costs of the Quebec Pulp and Paper Corp., of Chicoutimi. There is not much prospect of the company improving its position, it is reported, as long as it confines its operations to the production of groundwood pulp. This branch of the pulp and paper industry has not been profitable for sometime and there does not appear to be any immediate hope for a change for the better. The financial position of the company, however, has been improved through the redemption of the funded debt of its subsidiaries. These included $137,969 in bonds of the Chicoutimi Freehold Estates, Ltd.; $80,000 of La Compagnie des Eaux et de l'Electricité de Chicoutimi, and $85,700 of Ha!Ha! Bay Land and Build-

Two 2500 sq. ft. Foster Wheeler economizers installed in a paper mill power plant. The unit in the foreground has one door open to show the arrangement of the return headers connecting the extended surface economizer elements. The unit in the rear is ready for operation. These economizers are placed on their sides to conserve head room in the building.

Fuel Economizers for Paper Mills

84% efficiency in regular daily operation is secured in the paper mill power plant using the Foster Wheeler economizers shown above. Feed water at 308 deg. F. is fed to the 500 hp. boilers with resulting increase in capacity.

Heat is recovered from waste flue gases, reducing their temperature to 340 deg. F. and increasing the economy of the boiler unit.

The economizers are so arranged that they occupy a minimum of space without sacrifice of economy or accessibility.

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ing Co. Consequently, the capital set up of the company now includes only $7,000,000 of preferred stock and 100,000 no-par-value shares.

For the past year pulp sales totalled $927,534 and, after the deduction of expenses, there remained a gross profit on pulp of $59,313, as compared with $73,569 in the previous year. Deduction of other items, however, brought the deficit for the year up to $309,082. In 1928, the loss before providing for depreciation was $372,575.

Canadian Paperboard Creditors Meet

At a meeting in Toronto last month of creditors of the Canadian Paperboard, Ltd., inspectors were appointed representing the Bathurst Power and Paper Co., Miln Coal Co., Canadian Import Co., and Johnston and Ward. The assets consist largely of equities in book accounts and securities held by the banks, also certain other interests. The liabilities are approximately $300,000, which will be further increased in the event of the undertaking failing in the proposed reorganization and should the assets be sold. The claims under the bond mortgage are about $800,000, and the possible claims under power contracts between $300,000 and $400,000.

In the event of the assets being sold, it is estimated that creditors would not receive more than 4 cents on the dollar. At the meeting of creditors a proposal was made that will net the creditors at least 5 per cent in the reorganization of the business. The inspectors and the solicitors were instructed to investigate the offer made to the receiver, and if considered to be in the best interests of the creditors to accept it. The offer met with the approval of the unsecured creditors represented at the meeting.

The Canadian Paperboard Co., which went into liquidation early in the year, is a large manufacturer of boxboard and has mills at Frankford, Campbellford, Toronto and Montreal. The Toronto plant is quite new, having been built a couple of years ago.

Awards Made for Flooded Lands

Awards totalling $197,336.25 were handed down last month by Adrien Beaudry, K. C., chairman of the Quebec Public Service Commission, to cover farm lands which will be inundated to form a water storage basin on the Lièvre River about 30 miles above Buckingham. Twenty-four cases were dealt with in hearings over which Mr. Beaudry presided; nine more yet remain to be dealt with.

The floodings result from plans of the James MacLaren Co., Ltd., of Buckingham, owner of power rights along the Lièvre River, to develop hydropower for use in the pulp and newsprint mill which is now nearing completion. The storage basin for the impounded waters will be about 30 miles above the dam and mills and lands on each side of the Lièvre River will thus sink below the level of the waters at their average height. The highest amount awarded to any individual was $28,000 and the lowest $600, but the greater number of the awards was in the neighborhood of $8,500.

Annual Meeting of Canada Power and Paper

Six new members have been elected to the board of Canada Power and Paper Corp., bringing the number up to 18. A by-law was recently carried to that effect. J. W. McConnell has retired from the board, and the new directors are: F. G. Bush, W. P. Creagh, H. G. Yeoman, H. W. Jackson, M. J. O'Brien and J. C. McCrory. George Chahoon, Jr., president of the company, in moving the adoption of the annual report said that its position had been considerably strengthened by the acquisition of Port Alfred and Wayagamack, and overproduction had affected all mills for the past two and a half years; but he prophesied a better future when demand had caught up with production.

He particularly stressed the advantage which the corporation had obtained by the acquisition of Anticosti Island, which produced yearly from 100,000 to 150,000 cords of the finest wood obtainable. C. R. Whitehead, general manager of the corporation, described how cheaply wood could be shipped from Anticosti to the company's mills, and said that by raising of valuable fur-bearing animals, such as the silver fox, the corporation hoped to make a profit to run the island. It is estimated that the island contains from 15,000,000 to 18,000,000 cords of wood; and as there are numerous rivers, at no place does the wood need to be hauled more than two and a half miles.

Howard Smith Earns $1.97 Per Share

The annual report of the Howard Smith Paper Mills for the year ended December 31, 1929, shows operating profits well maintained at $1,284,481, as compared with $995,163 for the nine months ended December 31, 1928. The report is the second one since the reorganization, and no exact comparison of the profit and loss and surplus accounts can be made owing to the fact that the previously issued statement covered only nine months.

The earnings for the year were at the rate of $1.97 per share on the 220,000 shares of no-par-value common stock outstanding at the close of the fiscal year. The working capital position remains strong, with an excess of current assets over current liabilities of $1,825,032, which is slightly lower than the working capital shown at the close of 1928, namely $1,918,927. The plant, equipment and timber limits are shown in the balance sheet at $13,091,555, an increase of $744,694, as compared with December 31, 1928. This increase represents largely expenditures on the company's properties, and particularly additional equipment for the Cornwall mill. These betterments were financed entirely out of the company's resources and earnings.

To Survey Cut-Overs

An increased number of forest engineers on the staff of the provincial Lands and Forests Department are leaving Quebec this year to make a detailed inspection of all the large-scale lumber and pulpwood operations which have been carried out by the private companies in the 1929-30 logging season. The departmental engineers will make a detailed survey of all cut-overs to verify whether the companies have kept the terms of their various leases. Fines will be imposed in any cases where infractions are disclosed.

An important conference of fire rangers was held recently in the Legislative Buildings, Quebec. The gathering was called by Henri Kieffer, chief of the Provincial forest protective service, who presided, together with Henri Méthot, chief assistant of the service. Instructions on the making of reports, the organization and the administration of the protective service in the field, were given to the visiting rangers by Mr. Kieffer, who explained in outline the program of the protective service for the coming season. Special demonstrations of first aid were given by two of the staff physicians of the Department of Public Health. Accidents in the forests, it was explained, far from civilization, may have the gravest consequences, and the protective service is desirous of having all of its personnel trained to cope with such injuries.

According to plans submitted by the Shawinigan Water and Power Co. to the Minister of Lands and Forests for approval, 160,000 horsepower will be developed at Rapide Blanc, on the upper part of the St. Maurice River. In accordance with the announcement made at the annual meeting of shareholders of Shawinigan, it is estimated that the cost of this development will be $13,000,000. The falls to be harnessed are located some 25 miles north of La Tuque, and the development will be one of the most important in the province, with work on it scheduled to start within the next few months. The company was granted the rights by lease of the Rapide Blanc in 1928, and in accordance with the provisions of the law has submitted its plans to the Department of Lands and Forests.

At a meeting of the executive committee of the Canadian Pulp and Paper Association held sometime ago, an appropri-

THE NEW YORK TIMES. W

YING ITALY

IES. Column 1.

URGES ECONOMIES IN PAPER MAKING

Royal S. Kellogg, at Montreal Meeting, Tells Saving Possible From Wood Stage to Newsprint.

$50,000 FOR RESEARCH

Executive Council of Association Adds $20,000 to Fund—Crabtree Is Nominated for President.

From a Staff Correspondent of The New York Times.

Que., Jan. 30.—On

TO provide "economies in paper making" is the essential reason why paper mills in the United States, Canada, and other countries have already installed approximately 600 Oliver United units.

That these "economies" have been provided is indicated by the results and is emphasized by the large number of repeat orders for equipment.

Some Economy Features of Oliver United Paper Mill Units

Save-Alls

90% or better fiber and filler recovery; slow speed; low maintenance; high unit capacity.

Deckers

Maximum capacity per unit of filter area; uniform consistency; maximum fiber retention; permit quick change over in working colored stocks; slow speed; low maintenance.

High Density Thickeners

Give remarkable control of consistency to the bleachers, holding consistency at any desired point—20%, 25% or higher; retain finer fibers; high capacity.

Bleach Washers

Remove last traces of bleach liquor with minimum water; negligible fiber losses; reduce alum requirement; eliminate foaming.

Stock Washers

Practically 100% removal of chemicals with minimum water; reduce evaporation costs; maximum capacity with minimum floor space; greatly reduced labor costs.

Lime-Mud Filters

Compactness; lime, free from chemicals, suitable for reburning; minimum wash water when contrasted with decantation system.

Board Machines

One sheet, no laminations; remarkable smoothness and uniformity; fine fibers retained.

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ation was made for the building of an addition on the north end of the building for storage uses. At the same meeting the executive committee granted the Woodlands Section $12,000, an increase of $3,000 over last year's grant.

The Ste. Anne Paper Co. and the Murray Bay Paper Co., which are now both part of the Abitibi Power and Paper Co., have been dissolved. This is simply the final legal step in their absorption by the Abitibi company.

The operating departments of the Canada Power and Paper Corporation are being transferred from Montreal to Three-Rivers. It is expected that the executive staff will remain in Montreal, at least for the present. Three-Rivers is a central point for this organization, which now includes the Laurentide Co., Belgo-Canadian, Port Alfred, Wayagamack, St. Maurice Paper and Anticosti Corporation.

Increasing Importance of International's Canadian Properties

During 1929 there was continued improvement in operating efficiency at the newsprint mills of Canadian International Paper Co. The average daily production of the Three-Rivers mill was 653 tons in 1927, 667 tons in 1928, 692 tons in 1929, and in February 1930 it increased to 708 tons. The average daily production of the four machines at the Gatineau mill was 472 tons in 1928, 574 tons in 1929, and in February 1930, 581 tons.

In order to meet the increasing demands for the very high grade bleached sulphite pulp used in the manufacture of rayon, the capacity of the Kipawa mill was increased during 1929 from 250 tons to 330 tons a day. Both the Kipawa mill and the Hawkesbury mill, which manufactures bleached sulphite pulp for purposes other than the manufacture of rayon, operated at capacity during 1929.

Subsidiaries of Canadian Hydro-Electric Corp., itself a wholly-owned subsidiary of International Paper and Power, have power contracts calling for the ultimate delivery of 505,000 hp. of primary power. The plants required to produce this amount have been completed and financed. Pending the delivery of the full amount of 505,000 hp. as primary power, the surplus is being sold at secondary power rates for the generation of steam by electricity. During the first nine months of 1929, primary power was delivered at the rate of 250,000 hp. which was increased during the last three months of the year to 325,000 hp. During the present year deliveries will be gradually increased until in October the primary power delivered will amount to approximately 455,000 hp.

Acting on a complaint registered by L. E. Hughes, president of the Ontario Tourist Trade Association at North Bay, Ont., the Ontario Department of Game and Fisheries will investigate the charge that waste from the Kipawa mill is killing off game fish in the Ottawa river.

Price Bros. Make Strong Showing

The annual financial statement of Price Brothers and Co., covering the year ended February 28, 1930, reveals not only earnings well maintained in a period of unsatisfactory conditions in the newsprint industry, but also a striking improvement in the balance sheet of the company. Earnings for the year were equal to 2.13 per cent on the common stock of the company, and compares with 2.14 per cent in the preceding fiscal year. Net working capital is shown at $5,196,334, as against $2,304,842 in the preceding report. A sharp reduction in bank and other loans is the outstanding feature of the balance sheet. Operating profit for the year amounted to $3,332,799, as compared with $3,413,714 in the preceding year. Deduction of interest at $727,136 and depreciation at $1,254,232, left net earnings at $1,351,431, against $1,367,420 in the previous year. Payment of preferred dividends at $439,738 and common dividends at $853,664 left a surplus for the year of $58,029, against $63,092 in the preceding report. Previous surplus was brought forward at $2,667,146, making a profit and loss balance in the current report of $2,725,172.

The erection of a head office building in Quebec, to be known as "Price House," has been undertaken and is almost ready for occupation. At this date the company has completed the purchase of a controlling interest in Donnacona Paper Co., Ltd. The returns from the lumber branch of the business have again proved satisfactory, with practically no stock on hand.

Speaking of the forest reserves of the Province of Quebec, of lumber and wood products, before the members of the Hoo-Hoo Club, or the Fraternal Order of Lumbermen, G. C. Piché, director of forestry services of the Province, declared that with co-operation on the part of all those connected with this important national industry, it would not only be possible to conserve the actual forest reserves, but to increase them materially, with the help of scientific methods. Mr. Piché declared that the time had come for the Province of Quebec to diversify its production. He produced a large variety of wood products, such as artificial leather, rayon, twine, and many others, which are in great demand on the world market and can be produced in this country from the forests. In concluding, he declared his confidence in the future of the lumber industry in the province of Quebec and predicted a great expansion with the co-operation of all those engaged in the business.

Canadian International Paper Co. has elected the following officers: H. J. Webb, comptroller; C. B. Thorne, vice president in charge of sulphite manufacture, and F. G. Robinson, vice president in charge of sulphite sales of the company. The company owns and operates the Three-Rivers and Gatineau newsprint mills and the Kipawa and Hawkesbury bleached sulphite mills.

On April 1 the Perkins Tissue Mills, Ltd., acquired the plant at 51 Dubé St., Montreal East, formerly occupied by the Canadian Chemical Co. Crepe paper, tissue paper and waxed paper products will be manufactured. Operation of the plant is expected to begin early in May. A full line of high grade crepe papers, napkins, ornamental crepe paper, tissue paper, waxed paper, fancy wrapping paper, etc., will be made. The company is a subsidiary of the American Tissue Mills, of Holyoke, Mass. The officials of the company are Benjamin F. Perkins, president and general manager; Wm. H. Bond, vice president; J. Lewis Perkins, treasurer; and William F. Otto, assistant treasurer.

◆ ONTARIO ◆

Large Power Development by Abitibi

An agreement has been concluded whereby Abitibi Power and Paper Co. is to furnish 100,000 hp. of hydroelectric energy to the Hydro-Electric Power Commission of Ontario. The agreement in short is that the Hudson's Bay Power Co., a subsidiary of Abitibi, will develop the Abitibi Canyon and the rapids above it, obtaining 275,000 hp. of which the Power Commission will purchase 100,000 hp. for 40 years. This power will be available for mining and other industries in the north and especially in the Sudbury district, where the rate is to be $22.00 per horsepower. The balance of the power developed will be used by the company in the complete development of supplying steam by electric boilers for its mills at Iroquois Falls and Smooth Rock Falls, which are now partly supplied with electric power for this purpose from some of its other developments.

It is estimated that the project will cost the company $23,000,000, and the Hydro Commission will build the transmission line to Sudbury at an estimated cost of $3,500,000. Work on the new project will be commenced immediately and

LESS WEB BREAKS ON CAMACHINE WINDERS

One of the vitally important factors in favor of the Cameron principle of slitting and winding is that the whole web passes almost to the point where it is wound, before the slitting is done. Naturally there is no chance for the separate sections of the web to get into difficulty which is apt to be the case when there is a long draw between the slitters and the winding drum, a system employed in other types of winders.

LESS WEB BREAKS

On CAMACHINE winders the winding shaft extends clear across the machine and is supported at both ends by especially constructed journal bearings, which are arranged to keep this shaft always parallel with the axes of the drums as the rolls build up. This provision insures a perfectly cylindrical roll, which in turn insures less wrinkling and unnecessary strains with consequent breaks of web.

LESS WEB BREAKS

In old style winders without the riding roller the degree of hardness of the rolls depends almost directly upon the amount of drag on the web. With CAMACHINE winders the hardness of the rolls is regulated by the riding roller rather than by heavy tension of the sheet, which always tends to weaken the strength of the sheet.

LESS WEB BREAKS

NO LOSS OF PRODUCTION

CAMERON WINDERS INSTALLED AT WEEK END

CAMERON MACHINE CO.

61 POPLAR ST. BROOKLYN, N.Y.

pushed forward as quickly as possible, and it is hoped to have power by the end of 1931.

Up to the present, the company has been mainly, though not altogether, a newsprint producer, although from its inception the idea of developing power was always kept in mind, hence the name of the company; and this contract with the government, together with the power it is already supplying to municipalities in the north country, puts it definitely in the power business. This new horsepower added to what Abitibi has already developed makes the company one of the large power producers in Canada. On the Abitibi River it will now have developed 390,000 hp., as follows: 275,000 at Abitibi Canyon, 60,000 at Island Falls, 25,000 at Iroquois Falls and 30,000 at Twin Falls. In addition to the Abitibi river watershed, the company has the following other developments: 9,500 at Smooth Rock Falls, 25,000 at Sturgeon Falls, 20,000 at Espanola, 17,000 at Sault Ste. Marie, 35,000 developed by its subsidiary the Kaministiquia Power Co., and 2,500 at Murray Bay. When the present project has been completed, therefore, the total development will amount to practically 500,000 horsepower.

The size of the Abitibi company's power operations may be better understood in another way. For the first three months of this year the total kilowatt-hour output of the company and its subsidiary power companies was 148,123,119, and when the power is available from the Canyon development this figure will be increased to approximately 597,000,000, or at the rate of abut 200,000,000 kilowatt-hours per month.

This new development is at Abitibi Canyon, 65 miles north of Cochrane and 25 miles north of the company's present Island Falls plant, which is one of the farthest north developments. In addition to the power from the Canyon itself, there is tied in the power from the five great rapids immediately above the Canyon, that is to say, to the south of it, including the Lobstick, the Burntwood, the Clay, the Birch and the Oilcan, giving a total effective head of 240 feet.

The Abitibi Power and Paper Co. has called a special general meeting of shareholders to be held at Iroquois Falls on June 8 to ratify the extension of voting rights to the 6 per cent preferred shareholders upon default of payment of dividends. According to the wording of the present charter, the default must be in the payment of four consecutive quarterly instalments, and now it is intended to remove the word "consecutive." The matter was called to the attention of Abitibi by a banking group which purchased $26,000,000 of the preferred in 1928. The group was insistent upon the amendment before it acquired the stock, but finally accepted the company's agreement to use its best efforts to have the amendment made. A meeting for the above purpose was called in April of last year but had to be postponed because the shareholders failed to send in sufficient proxies. A further attempt is now being made.

Good Year for Interlake Tissue Mills

According to the recently issued annual report of Interlake Tissue Mills, Ltd., the company earned gross profits in 1929 of $150,220. Bond interest absorbed $11,635, depreciation $63,926, income tax $6,300 and premium on bonds redeemed $40. Net profits left were $68,319. This, however, was after allowing 42.7 per cent of gross profits for depreciation. On the 6,250 shares of capital stock of $100 par value outstanding, profits were equal to 10.93 per cent, as compared with 8.22 per cent in 1928 and 6.02 per cent in 1927. Dividends were paid at the rate of 6 per cent, amounting to $37,500, and $30,819 was added to surplus which brought the total amount carried forward into the current year to $146,983. The balance sheet shows total assets of $1,729,319 made up of fixed assets of $1,380,115 and current assets of $349,204. Current liabilities were $59,902 making net working capital $289,302. Reserves aggregated $705,478, of which $584,691 was for depreciation and $106,717 in distributed surplus.

The following directors have been appointed to serve during the current year: F. S. Duncan, Provincial Paper, Ltd.; J. Halbert, J. R. Booth Co.; George Carruthers, Interlake Tissue Mills; Howard Smith, Jr., Howard Smith Paper Mills; J. E. Patterson, Abitibi Power and Paper Co.; C. B. Thorne, Canadian International Paper Co.; A. G. Pounsford, Provincial Paper, Ltd.; D. L. McLeod, Ontario Paper Co.; C. Nelson Gain, Interlake Tissue Mills; H. G. Schanche, Abitibi Power and Paper Co.; J. H. Black, Spruce Falls Power and Paper Co.; D. McLeod, Kenora Paper Co.; J. Silver, Abitibi Power and Paper Co.; John Ball, Beaverboard Fibre Co.; J. Wilson, Dryden Paper Co.; Arthur Brown, E. Pullan, Ltd.

Annual Meeting of Safety Association

Safety matters and accident prevention problems in the pulp and paper mills of Ontario were under review at an enthusiastic annual meeting of the Ontario Pulp and Paper Makers' Safety Association held in Toronto a few weeks ago, following a dinner at which Victor Sinclair, chairman of the Workmen's Compensation Board, was the chief speaker. Mr. Sinclair addressed the large number of mill representatives present on the relations existing between his organization and the pulp and paper industry in the Province, pointing out that all groups of the pulp and paper industry had operated at a lower compensation rate during the past year than during the previous, with the exception of the logging group.

Compensation costs in the pulp and paper mills had been reduced from $2.00 to $1.50, which indicated that the industry was profiting from their excellent work along safety lines. While the lumber industry had made great progress in accident prevention, it was more difficult to get safety practices in the logging group than in any other, largely owing to the outdoor nature of the work and the moving about of the workmen. He urged efforts toward rehabilitation of injured men in the pulp and paper industry and suggested that more attention might be paid by the mills in the way of placing men in positions for which they are the most suitable. In a discussion led by George Carruthers, of the Interlake Tissue Mills, following the address, it was suggested that the mills could save money by enlisting medical and first aid services at the outset of accident cases rather than attempt to reduce medical aid costs.

According to the report of secretary-engineer A. P. Costigane, the record for the past year as compared with the previous one, was fairly satisfactory. The non-fatal accident record showed considerable improvement, and the fatal accident record compared equally with even the best year in the past. This was due to improved organization in each mill and closer co-operation with the association. The total number of accidents compensatable and non-compensatable in 1929 was 1,242, involving 17,853 days' lost time, as compared with 1,354 non-fatal accidents involving 20,338 days' lost time in 1928. The decrease in the number of employees in 1929 was absolutely negligible.

A feature of the gathering was the presentation of trophies and medals to the winners of the various safety contests staged during the year. The trophy for 1929 offered for competition by the Ontario Pulp and Paper Makers' Safety Association was won by the team representing the Howard Smith Paper Mills, at Cornwall, with the score of 376 points out of a possible 400. The running-up team was that of the Kenora Paper Mills, with a score of 359 points. The trophy and individual medals were presented to the former team and individual medals to the Kenora team. Class A contest was won by the Hawkesbury mill of Canadian International Paper Co., with a record of 11 non-fatal accidents involving 103.5 days' lost time or equal to 0.079 day per 1,000 hours' exposure to hazard. Class A runner-up was the Sault Ste. Marie mill of Abitibi Power and Paper Co., with a record of 53 non-fatal accidents involving 665.5 days' lost time or equal to 0.471 day's lost time per 1,000 hours' exposure to hazard. Don Valley Paper Co., Toronto, was Class B winner, with a record of one non-fatal accident, involving 6 days' lost time, equal to 0.059 day's lost time per 1,000 hours' exposure to hazard, while the runner-up was Miller Bros., Glen Miller, with a record of one non-fatal accident, involving 9 days'

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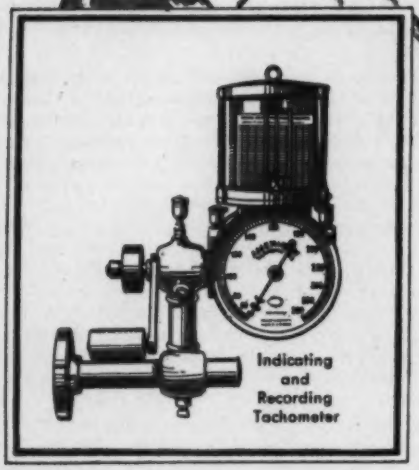

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This instrument delivers a record over a full-day period, showing every variation in speed from minute to minute.

Hundreds of industrial operations depend upon the maintenance of uniform speeds. Variations in speeds mean waste ... on paper machines, on textile machinery, printing presses, engines, turbines, conveyors, blowers, etc.

Send for a catalog describing all types of tachometers.

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American Quality Gauges	A-41	American Tachometers	J-41	Hancock Globe & Check Valves	X-41
American Temperature Controllers	R-41	Ashcroft Power Control Valves	M-41	Metropolitan Injectors	Y-41

lost time or 0.061 day per 1,000 hours' exposure to hazard.

Following a report presented by William Miller, chief sanitary inspector for Ontario, in which he stated that the total bill for accidents in woods operations had risen from $35,000 to $58,000, it was recommended that the incoming executive appoint a committee to go into the question of mounting compensation costs in the woods departments. This action will be taken in the near future.

The importance of the pulp and paper industry in keeping things going in comparatively small community centers during the winter is well instanced in the case of Georgetown where, it is reported, employment has been steady throughout the winter months. About 30 per cent of the population of Georgetown, which is stated to be 2,500 in all, is employed industrially. More than half of these industrial employees find employment in the plants of Alliance Paper Mills, Provincial Paper and Provincial Coating Mills, located at Georgetown.

Changes at Alliance Paper Mills

George W. Pauline, assistant managing director of Alliance Paper Mills, has been appointed managing director, in succession to K. S. Maclachlan who resigned to take the position of general manager of the Fraser Companies, Ltd. L. E. Fleck, manager of the coated paper division, has been made assistant to Mr. Pauline. George C. Winlow, who has been in charge of sales for Alliance, has been made a member of the board of directors of the company, and also a director of Ritchie and Ramsey, which forms part of the Alliance organization.

Before departing for New Brunswick, K. S. Maclachlan, the retiring managing director, was tendered a dinner by the executive officials of the company at the St. Catharines Golf Club, the gathering being presided over by George W. Pauline, the new managing director. A number of outside paper men were among the guests at the dinner. During the evening a presentation of a brief-case was made to Maurice Phelps, assistant superintendent of the sulphite mill at Merritton, who is leaving to join the forces of Crown-Willamette. The presentation was made by H. E. Karberg, superintendent of the sulphite mill.

Sometime ago C. E. French, of the Toronto office of the Howard Smith Paper Mills, conceived the idea of perpetuating the name of the president, C. Howard Smith, among the great men and business leaders of Canada and, enlisting the co-operation of a number of salesmen and executives of the company, had an oil painting of the president done by a leading Canadian artist. The portrait was informally presented to Mr. Smith at his residence in Montreal last month, and will likely be hung in the head office of the company in Montreal.

George Brown, who for the past several years has been secretary-treasurer of Firstbrook Boxes, Ltd., Toronto, has been promoted to be general manager and secretary-treasurer of the company, succeeding E. Victor Donaldson, who is the new general manager of the Robert Gair Co.

Large Revenues Derived from Forests

According to the annual report of the Ontario Department of Lands and Forests, as tabled in the Legislature, fifty-two timber areas, ranging in size from one-quarter square mile to 975 square miles, were sold by the department during the year, under advertised public competition. Thunder Bay district had 12, Timiskaming 10, Cochrane 9, Kenora 7, Rainy River 6, Sudbury 5, Algoma 2 and Nipissing 1. Of these 19 were exclusive logging propositions, 14 were for pulpwood operations and the remainder for tie-making, clean-up logging and fuel wood. Revenue derived from the sale of Crown lands for settlement, tourist, townsite and other purposes, amounted to $137,245.47. The acreage of the land sold was 89,529. In addition, the department collected in former sales and leases the sum of $233,171.29.

Revenue derived from provincial land tax amounted to $127,580.59. The gross revenue of the department last year was $5,059,878.20 and of this sum $3,729,554 was capital. This represents an increase of ordinary revenue over 1928 of $172,091.43. Expenditures for the year totalled $3,405,615, of which $2,179,850 was ordinary. One of the largest items of expenditure was that for fire-fighting, $1,677,671 having been spent on this phase of the service. This represents an advance of $450,000 over the previous year.

Air Service Reviewed

A comprehensive review of the Ontario Air Service occupied the attention of the convention of the Ontario Forestry Branch held recently at Sault Ste. Marie. An address on this subject was delivered by Captain Roy Maxwell, director of the Provincial Forestry Protection Service, who announced that two new metal planes will form part of the flying equipment this year. They were built in Milwaukee, and are capable of carrying a load of 1,000 pounds in addition to 100 pounds of operating equipment. Three new Moths will also be added and two will be scrapped.

Captain Maxwell traced the beginning of the air service and told how those who were connected with the forestry branch during the war saw in the aircraft a possible means of patrolling the inaccessible areas of the province and how, in 1924, their dreams were realized when the service was established.

Ontario Paper Boat on Way to Canada

Built for the Quebec and Ontario Transportation Co., a subsidiary of Ontario Paper Co., the new motorship "Thorold" left Fowey, England, for Halifax, and will proceed to Montreal and Thorold. At the latter town she will be placed on the Great Lakes service carrying newsprint from Thorold to Chicago. At Halifax the "Thorold" will be equipped with the latest type of radio apparatus.

The ship is strictly a new departure in design, having been built especially for the carriage of newsprint rolls, her capacity being 4,400 rolls of paper, or similar to the "Markland" operated by the Mersey Paper Co., of Liverpool, N. S. She also has the added advantage of being able to be immediately transformed for the grain or pulpwood service.

Named after the town of Thorold, where the Ontario Paper Co. has its newsprint mill, the ship will be the first vessel of its type using Diesel engines. She is equipped with the latest type of mechanical refrigeration, and was built in Earle's Shipbuilding yards at Hull, England. Built to British Corporation class, she will meet the requirements of the Board of Trade and Canadian Steamship inspection. Her principal dimensions are: length over all 258 feet; breadth 43½ feet; depth 23 feet; and height of trunk 13¼ feet. She is of a cruiser stern, trunk deck type.

According to word from Port Arthur, Mayor Gibbs was in receipt, a few days ago, of a telegram from Hon. William Ferguson, Premier of Ontario, assuring him that by the end of April both paper machines at the Thunder Bay mill, owned and operated jointly by Abitibi Power and Paper and Canada Power and Paper, would be running full time. One of the machines has already started operations, and a gang of men has been taken on overhauling machinery and equipment.

The directors of the Industrial Accident Prevention Association of Canada have ruled that all platen cutters and creasers used in the paper box industry must be equipped with the Sorey-Gold or such other device as may be acceptable to the board. If the device is not installed after the request is made by the inspector, the Workmen's Compensation Board have the power—and will in all likelihood exercise it—of levying a special assessment against any company failing to comply

An example of a high-speed LENIX equipped pump drive. Motor rating 200 H.P. Belt speed 6000 F.P.M. Spare pulleys of different diameter in foreground.

All Things Connected With the LENIX Are *Standard*

THE LENIX is a specialty which you buy from us but all other equipment connected with the LENIX installation is standard and can be purchased anywhere.

standard, high-grade belting.

standard crown face pulleys for both driving and driven units.

standard motor, generator or engine.

This makes the LENIX economical should you wish later to change the pulley ratio. You can use the same LENIX (assuming the same transmission of power). Only the pulleys need be changed. These can be picked up at any mill supply house.

Users of LENIX Drives who later on changed their pulley ratios will tell you that this standardization of the LENIX was a big help and saved them money.

F. L. SMIDTH & CO.

The Lenix Drive People

Engineers Incorporated 1895

225 Broadway, New York, N. Y.

The LENIX Drive

REG. U. S. TRADE MARK

with the request, and furthermore, in the event of an accident happening which would have been prevented had a satisfactory safety device been installed, the board will in all probability assess the entire cost of the accident against the company.

◆ NEW BRUNSWICK ◆

Another new Maritime pulp mill has begun to turn its wheels with the starting up of the new high-grade bleached sulphite mill, which was recently completed by the Restigouche Co., Ltd., a subsidiary of Fraser Companies, Ltd. at Athol. The new mill will have a capacity of 45,000 tons of pulp annually, although for the present the output will be only 15,000 tons.

A number of members of the shipping staff of International Paper, located at Cornerbrook, Newfoundland, were moved temporarily to St. John, N. B., to ship newsprint from the latter port. It was found necessary to use the port of St. John in shipping the newsprint produced at the new Dalhousie plant until the ice had ceased to be a problem in Baie des Chaleurs. When the ice had cleared away from the mouth of the Restigouche and the Dalhousie Bay harbor, and the new dock and reconstructed dock of International at Dalhousie, the shipping of the paper from the mill was started. The first shipment made from St. John after being transported by rail from Dalhousie went on the Steamer Hedron, to Mobile. There were 2,000 tons in the cargo. In order to handle the shipment, the members of the Cornerbrook dock staff were transferred for an absence of several weeks. Three shipments were made from St. John.

The twentieth annual report of John Kenney, of St. John, factory inspector for the province, made extended references to the opening of the pulp and paper mill at Dalhousie, the opening of the pulp mill at Athol, and the reopening of the St. George pulp mill. Mr. Kenney reported satisfaction with all these plants, after a thorough investigation and inspection of each piece of machinery and building. He also discussed the possibilities for a pulp mill at St. Leonard and another at Chatham or Newcastle.

New Brunswick, where great areas of blackened stumps attest to the damage done by forest fires in past years, is this year witnessing an intensive campaign for the movement to "Save the Forests." Every newspaper in the Province is carrying advertisements calculated to arouse the people to forest fire hazards. The campaign, which was started at the end of April, will last until the latter part of June, and may be further extended if the season proves more hazardous than usual. Prof. B. K. Sandwell, of Montreal, will tour the Province, speaking to service clubs, schools and fish and game protective associations. Radio addresses will be given by Premier Baxter and the Minister of Lands and Forests.

◆ NOVA SCOTIA ◆

Fear Depletion of Nova Scotia Forests

In the Nova Scotia Legislature, Hon. W. L. Hall, Attorney General and Minister of Lands and Forests, moved an amendment last month to the Land Tax Act. The new measure will mean Government control of pulpwood cutting in so far as owners of wood lands totalling more than 1,000 acres are concerned. The bill provides that no such holder shall fell any tree unless authorized and in accordance with the terms and conditions of a license, to be issued "subject to such terms and conditions as the Minister deems proper" and subject to being revoked by the Minister at any time. The word "tree" for the purposes of the Act is taken to mean any tree or sapling suitable for being manufactured into wood pulp. A fine of $10 to $20 is applicable to offenders against the Act, with the "felling, or attempted felling, aiding, abetting, counselling or procuring the felling of each tree" being constructed as separate offenses. The amendment is to come into force by proclamation.

Strenuous opposition was raised to this measure on the ground that it was an attempt to create a monopoly in favor of the Mersey Paper Co., while the Government defended it as a measure that would conserve Nova Scotia's timber resources as an industry in perpetuity.

On third reading the measure was passed by the very close vote of 19 to 17. Hon. Mr. Hall, the sponsor of the bill, stated that he hoped the Act would never have to be proclaimed; but if circumstances should arise which would make profitable the stripping of large forest holdings in Nova Scotia in a single year, it was necessary to have legislation on the statute books which could be invoked at short notice to prevent such depletion. There was a possibility, he said, that other sources of supply would become exhausted, and that importation from Russia, still in the experimental stage, would not prove feasible. In that case, large tracts in Nova Scotia might be depleted in short order.

Gratifying reports covering the first period of operation of the Minas Basin Pulp and Paper Mills, Ltd., were presented to the shareholders at the annual general meeting held recently at Hantsport. Despite costs of tuning the mill up to capacity, the mill showed a substantial profit for the nine and one-half month period ending last November 30. The outlook for the coming year, it was reported, was satisfactory, with groundwood contracts all renewed on a satisfactory basis.

◆ BRITISH COLUMBIA ◆

International May Build in British Columbia

According to a Vancouver dispatch, International Paper is expected shortly to announce a program for expansion in British Columbia, as a result of its application for extensive water rights on the Kokish river. The latter is in northern Vancouver Island, near the Nimpkish River, where power rights were acquired sometime ago by Canadian Forest Products, Ltd., backed by the International Harvester interests. Now International Paper is understood to have taken the option held on the property of the Canadian Forest Products, Ltd., and is planning to establish a large pulp and paper mill on Vancouver Island, which will be the company's first producing unit on the Pacific coast.

The proposal to utilize the Kokish signifies, it is believed, the company's intention to tie up the consolidated power resources of the two rivers so as to provide ample hydro resources to operate a mill much larger than was previously contemplated by Canadian Forest Products. The Provincial Government has a reserve on the Kokish River site at present, and has a party of engineers making a survey of the power possibilities there.

Expansion Planned by Powell River Co.

Development of the Powell River Co.'s operations will continue as a natural sequence even after the completion of the present contract and program calling for an expenditure of $8,000,000, according to A. E. McMaster, general manager of the company. Referring to the company's huge development program in connection with the Lois river power scheme, the first unit of which will be completed in the early part of next year, Mr. McMaster said that an additional $5,000,000 was planned for new developments on the completion of the present work, making a total of $13,000,000 in new operations under way and contemplated.

The completion of the initial unit at the Lois river project, he said, would give the company an additional 34,000 hp.

DECKERS

PULP OLD PAPERS

We offer a wide choice in vat design to suit every requirement. This machine in your pulp mill, as a multi-cylinder washer for old magazine or bleached stock, or the special design for handling mixed papers for Boxboard will meet your most exacting specifications.

Our long experience enables us to market these high grade machines at a very reasonable price.

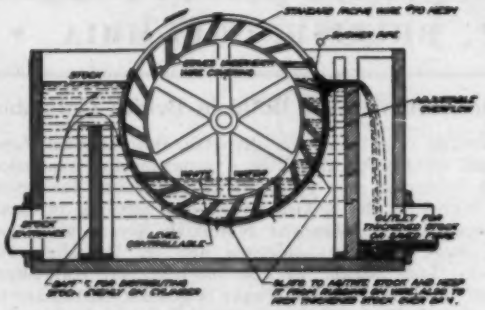
Sizes: 30" x 48" up to 48" x 120"

New and Improved Rogers and Special Wet Machines

The standard machine for producing high density sheet pulp for direct use or for Dryer. A low cost, simple, well proven means for reducing your labor, power and upkeep. All Rolls and Cylinders equipped with roller or ball bearings.

When dry stock is not desired the Single Press will handle the same high capacity with the same labor at still lower cost.

Built in units of 50 tons capacity or less



A. D. WOOD Thickener Saveall, Washer, Water Filter

The design of this popular machine is such that the cost per unit of material handled is amazingly low.

The wire does not have to drive and carry a couch roll, nor even help to discharge the thickened stock. Long life results and, with the sturdiness of the remaining parts, makes it almost automatic in operation, so seldom is any attention necessary.

Glens Falls Rolling Action Flat Screen

CONSTANT EFFICIENCY, HIGH SCREENING CAPACITY AND CLEANER STOCK

Troubles eliminated	*Advantages given*
Toe Blocks	Smooth, Quiet Operation
Pound and Clatter	Freedom from Repairs and Adjustments
Diaphragm Distortion	Low Power Consumption
Variable Capacity	Constant High Capacity

GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

Waterous Ltd., Brantford, Ont. Manufacturing Agent

Mansfield, Bolton & Kent, 501 Fifth Ave., N.Y.C.
Eastern Representative

See pages 344 and 345 in the 1929 Paper and Pulp Mill Catalogue

which, together with the 50,000 hp. now available, would provide an aggregate of 84,000 hp. for paper production at the Powell River plant.

The yearly output of the company now represents 152,000 tons, and with the completion of the installation of the new paper machine, the mill will be equipped for a further output of 38,000 tons, giving a total output of 180,000 tons. The daily output of the plant at present is placed at 520 tons, and the paper machine now being installed will give an additional 130 tons per 24 hour. Mr. McMaster stated that 15 per cent of the company's output goes to supply the Canadian market, while 85 per cent of the newsprint goes overseas to British and foreign markets. The Australian market remains firm, he said, although there was the keenest competition for the newsprint trade of the Commonwealth. A large percentage of the company's output goes to both the Pacific and Atlantic Coasts of the United States.

The machine-room crew of the Powell River Co. is very proud of the recent performance of the big No. 5 234-inch paper machine. This machine was installed during the plant additions of 1925-26, and recently it ran for 52 consecutive hours without a single break in the sheet. The machine ran at 1,000 feet per minute.

The Powell River Co. appreciates to the full the value of research. The company is co-operating in a practical and extensive manner with the University of British Columbia in research work on the properties and uses of Pacific Coast woods with particular reference to the papermaking. The results of this investigation will be available later to the paper industry of the Pacific Coast. A piece of research work recently carried out in the company's own laboratories owed its inception to a customer's complaint. This customer, a printer, was having trouble with ink penetration. The company set its chemist to work to find the cause of the trouble, and, for the benefit of its customers, published the results of the research in pamphlet form.

Starting of Vancouver Kraft Mill Delayed

No announcement has yet been made concerning the plant of the Vancouver Kraft Mills, Ltd., regarding the operation of their plant at Port Mellon. It is reported that F. W. Leadbetter, president of the company, was recently in conference with other company officials at Vancouver, but no decision was announced and meanwhile the plant has not commenced operations.

It is understood that one of the chief difficulties in the way is the situation of the lumber markets, which is now very quiet in British Columbia, particularly since the new tariff was formulated in the United States. As the Vancouver Kraft Mills plant also includes a saw mill with a capacity for 200,000 feet, this situation naturally seriously affects the plant. Another reason rumored as being partly responsible for the delay is a change in the marketing agencies of the Leadbetter interests.

Contract has been awarded and work commenced on the construction of a large, six-story, reinforced concrete office and warehouse block for the Columbia Paper Co. on Nelson St., Vancouver. The building is being erected for Columbia Properties, Ltd., at a cost of $125,000, and will be taken over by the paper company on completion. Later it is proposed to erect an addition on adjoining property secured. But for the present this area will be filled in and graded for use as a parking area for cars and trucks of persons having business with the plant.

While the provincial Government's plan for replacing the unconstitutional tax on crown-granted timber, designed to penalize exportation of unmanufactured logs, has not yet been divulged, it is understood that the following plan is under consideration. A general tax on all crown-granted timber is to be imposed. Collection is optional with the Government. Operators are to be given the option of entering into a voluntary agreement to have their timber manufactured in the Province. Those who accept this option will

Leadized Piping in mill of
Kalamazoo Vegetable Parchment Co.
Kalamazoo, Mich.

"LEADIZED"

A continuous protective coating, inside and outside—Not a lining

Submit your piping problems to us

The Locomotive Terminal Improvement Co.

Engineers, Fabricators and Erectors of all kinds of piping systems

General Office: 80 E. Jackson Blvd., Chicago, Ill.

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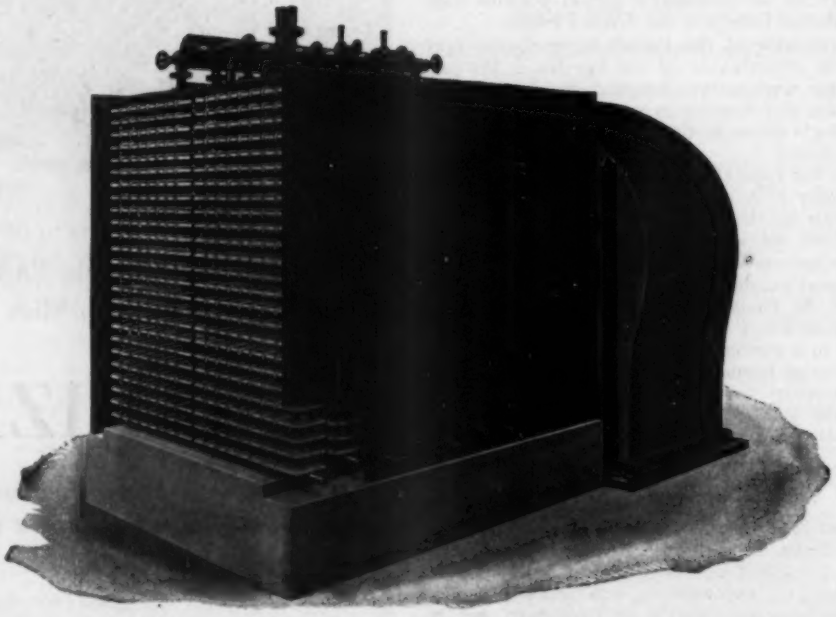
Stickle Blast Coil Heater or Economizer Will Dry Your Felts With Hot Air



STICKLE air cooled condenser maintains a vacuum of 10 to 15 inches on the return line of your paper machine, returns condensate to the boiler room as hot as it can be handled with a pump without the admission of cooling water. Will heat 1000 cubic feet of air per minute for every ton of paper dried per day, furnishing hot air in the pit to dry the felts and absorb the vapor under the dryers, making a direct saving of at least 15 per cent in steam consumed for drying the paper and ventilating the machine room. This can be done at a moderate cost. Are you interested? Complete plans furnished without charge.

Stickle Steam Specialties Co.
INDIANAPOLIS, IND.

AUTOMATIC STEAM CONTROLS
BLOWING THROUGH DRAINAGE SYSTEMS
COMPLETE LINE STEAM SPECIALTIES

not be called upon to pay the tax, while others will have to pay. This plan is said to have received the approval of constitutional experts as being reasonably safe from attack in the courts.

Several machines for the Westminster Paper Co.'s new plant at New Westminster are being fabricated at the machine shop of Webb and Gifford, New Westminster. Among the equipment are two devices for rolling finished paper, which have been designed and built by the New Westminster machine plant. Webb and Gifford are also assembling and fitting two rollers for handling the continuous sheets prior to cutting. These rollers are surfaced with hardwood, with enclosed gears and shafts; they are four feet each in diameter and six feet in width.

A new paper scow is now being built by the Burrard Shipbuilding and Engineering Co. of Vancouver, for the Powell River Pulp and Paper Co. This scow will be able to handle 500 tons of newsprint and is being built in view of providing accommodation for the increased capacity of the plant when the present addition is completed. The Powell River Co. already has five scows in operation between the plant and Vancouver, from which point the newsprint is delivered to local newspapers or shipped by rail.

Westminster Plant Has Good Supply of Orders

With 100 men rushing final work and with half the machinery installed, the Westminster Paper Co.'s $750,000 plant is expected to be ready for operation by the end of the present month. The main building now has most of the heavy papermaking machinery in place. The roof of the adjoining building has also been completed, and the special paper-finishing machinery is being installed. Four cars of equipment are being unloaded as fast as place is being made ready.

More than $20,000 worth of the new equipment has been manufactured in local machine shops. Working on patterns and plans supplied by the firm, the shops have fabricated steel shaftings, pulleys, bearings, rolling devices and folding machines. Heaps Engineering Co., Westminster Iron Works and Webb and Gifford are among the New Westminster firms sharing in the machinery contracts. Repair work to old equipment has been made on the premises, some of it with the assistance of local welding concerns.

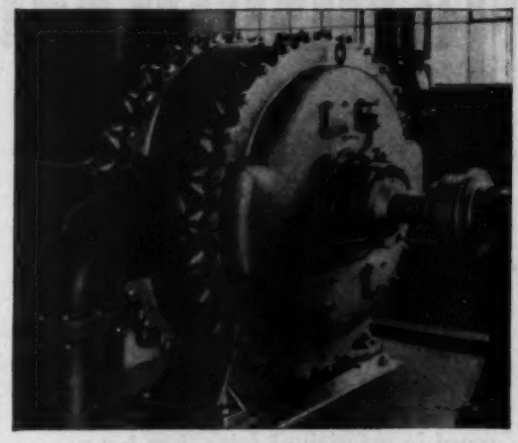
Officials of the company report that business prospects for the new plant are most satisfactory. There are said to be sufficient orders on hand from abroad and from the East to keep the plant operating at full 24-hour capacity for eight months.

❖ MANITOBA ❖

Manitoba Power Site Attractive

In the event that the British syndicate, which has a priority permit for development of White Mud Falls, fails to exercise its option, it is reported that Abitibi Power and Paper Co. will seek the privilege of developing the site. It is felt, however, that the British syndicate will not readily let go of the greatest waterpower in the province, situated on the Nelson river in Northern Manitoba. The present priority permit expires on May 21, and the Provincial Government has not yet been notified of the syndicate's plans.

The Abitibi company, which owns the Manitoba Paper Co., is understood to be ready to go ahead with developments adjacent to White Mud Falls, and would find the waterpower available there necessary for its work. More than 1,000,000 cords of pulpwood are within accessible distance of the falls, it is said. When questioned in this connection, officials of the Abitibi company declined to state definitely whether they are interested in the development of the White Mud Falls site, should the British syndicate not exercise its right. While doubting they would be interested in the power site, the officials stated that they are interested in pulpwood sites.



Nash Hytor Vacuum Pumps are furnished in standard sizes with capacities up to 5000 cu. ft. of air per min., at 10 inch vacuum.

For producing the vacuum
on felt cleaners

NASH Hytor Vacuum Pumps can be used as dry vacuum pumps or wet vacuum pumps. For this reason they operate equally well on felt cleaners which work by suction alone or which employ suction in connection with a spray of water.

Simple in construction, Nash Hytors have only one moving part, a rotor which revolves without contact in its casing. Long, trouble-free operation is assured, because there are no working parts which are subject to wear or which can get out of adjustment.

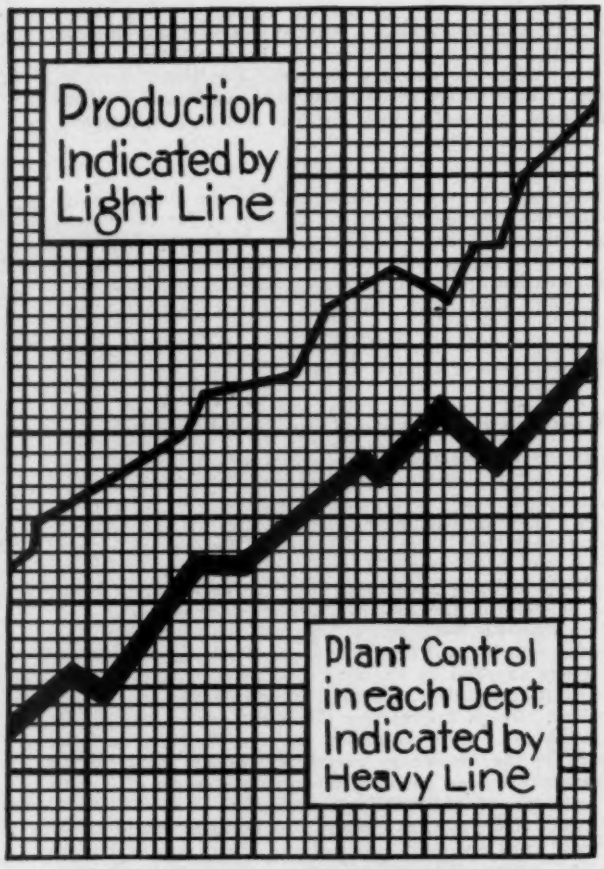
If you are not familiar with Nash Hytors write for descriptive bulletins.

THE NASH ENGINEERING CO.
161 WILSON ROAD, SO. NORWALK, CONN.

Nash Hytor
VACUUM PUMPS & COMPRESSORS

To Insure Quality and Service-

From the time Appleton Felts and Jackets were first made, 39 years ago, right up to the present, they have been made to insure quality and service. Regardless of the production of Appleton Felts and Jackets, the plant control—the checking which every operation undergoes before the wool is a finished felt—has been the same. This rigid checking has always paralleled our production.



This trade mark is today the symbol of quality and service in felts

And, what does this plant control mean to the mill operator?

Simply this—Appleton Felts and Jackets are designed with technical foresight as quality products and made specifically for the definite requirements of the customer.

That's the real reason for their wide preference today.

APPLETON WOOLEN MILLS
APPLETON, WISCONSIN

Appleton
Felts and Jackets

ENGLAND

Associations Discuss Research and Recovery of Chemicals

At the general conference of the technical section of the Paper Makers' Association held recently, Magnus Christiansen, chairman of the Norwegian Research Committee, read a paper on scientific research, and said, in reference to his subject that it was a form of insurance as essential as fire insurance, and should form part of the necessary expenses of the paper industry. The advantages of the paper experts of the two countries thus meeting to pool the results of their scientific investigations have become apparent to many of those present, and it is prophesied that before long there will be a central research department, maintained by the principal papermakers in co-operation, to carry on the work of scientific research to far greater lengths than the ordinary mill chemist has at present the opportunity for doing.

A talk of equal importance was given at a meeting of the South of Scotland Division of the technical section of the Paper Makers' Association, when J. A. Walker gave a complete account of the process and apparatus in use in many of the Scottish esparto mills, for the recovery of the chemicals used in the preparation of esparto grass for papermaking. Mr. Walker pointed out that in the recovery of these valuable chemicals nothing was lost, for even the spent steam and hot water were made to do service again and again. When the boilers were opened after the boiling of the grass, the liquor was run off and allowed to drain as completely as possible, after which the boiled grass was washed in a boiler two or three times. The recovery plant was usually in four sections, joined together, which worked on the principle that the boiling point of a liquid was lower the less pressure it was under. The liquor flowed in pipes slowly through each section in succession, the pressure being lowered as it went. Steam entering the first section caused the liquor in the tubes to boil and, at the same time, became itself condensed and ran away as hot water.

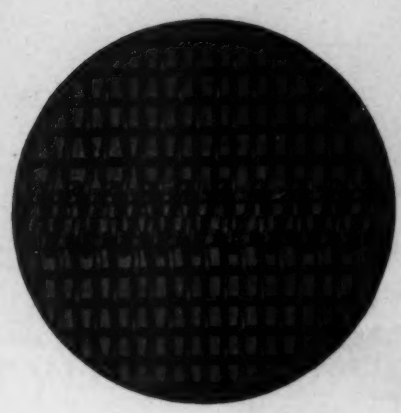
The steam from the liquor was conducted into the next section, which caused the liquor in the tubes to boil at a lower temperature because of the lower pressure. When the liquor left the last section it was so condensed that it contained only fifty per cent of water. This was pumped into a storage tank from which it was fed into a rotary furnace, consisting of a slowly revolving steel shell, lined with fire bricks, arranged so as to allow a slight fall from inlet to outlet. As the thick liquor worked through this furnace, it first of all lost its water, and then the organic matter took fire, and was eventually discharged from the other end as glowing cinders composed almost entirely of carbon and sodium carbonate.

Newsprint Section Progressing

The newsprint section of the industry is considered one of the most satisfactory and progressive sections. Developments have been made in the size of the machines, speed of running, labor-saving devices, and tonnage output. One example of this progress is afforded by the report of the fortieth general meeting of Edward Lloyd, Ltd., when Lord Camrose, chairman of the company, presided. The last machine installed by this company has a wire width of 262 inches, capable of producing a reel of paper 245 inches wide, finished "trim." Previous to 1914, half this width was considered large, and when a machine was built capable of making paper 165 inches wide, it was thought that the extreme limit had been reached. For providing paper suitable for the picture papers, a large calender stack has been built, which is reckoned to be one of the widest manufactured to date.

Another example of progress is the firm of Bowater's Paper Mills, Ltd., with a mill at Northfleet claimed to be one of the most up-to-date in the world, which same firm is having an-

Standard Eastwood Seam,
Magnified Several Times



Put a Strong Light under this Eastwood seam

What would a strong light show if you put it under the patented seam used on all Eastwood "Perfection" Fourdrinier Wires?

This is what you'll find:—The patented Eastwood seam has very nearly the same suction area as the body of the wire. As you know, that makes for better operation when running on the Fourdrinier machine.

This patented seam is now standard on all our Fourdrinier wires, from those for 10 lb. tissue up to high speed newsprint.

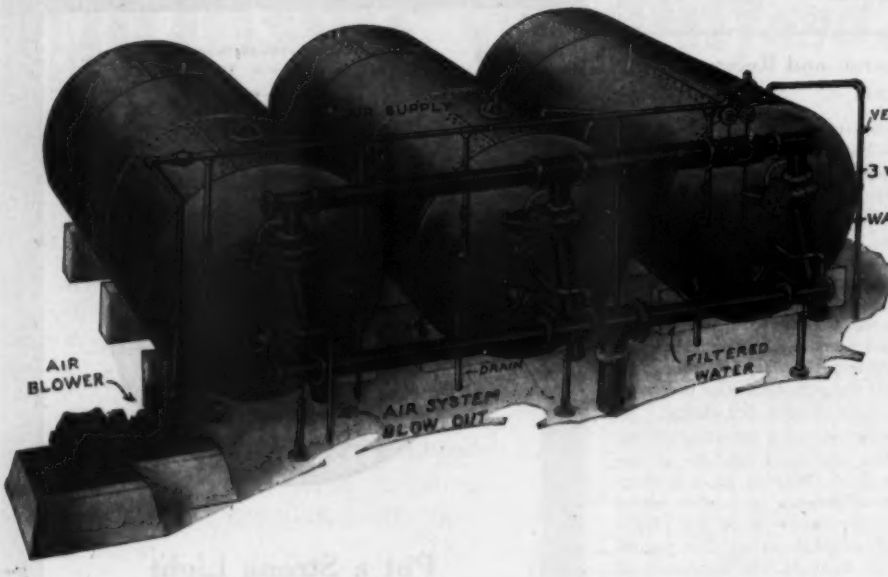
EASTWOOD WIRE CORPORATION

(Established 1877)

Belleville, N. J.

"American Paper Made on American Wires"

EASTWOOD
"Perfection" WIRES
"Perfection" VALVES



An illustration of a Three-Unit Installation of Norwood Steel Pressure Filters.

Continuous Production Uniform High Quality

DIRT-LADEN, debris-filled water never enters the paper making processes of mills equipped with Norwood Filters. Drouth or flood, high water or low—the Norwood Filtration System is the efficient guardian which keeps out all foreign matter and pollution. Norwood Filters have lowered production costs in hundreds of successful paper mills by making possible uniform paper quality with fewer "seconds" and by eliminating shut downs during dirty water periods.

Write today for the Norwood Filter Catalogs

A Norwood Filtration System, either pressure or gravity type, is a sure-paying investment for every plant with a water filtration problem. Write for Norwood Filter Catalogs or, better still, ask Norwood's engineers to make a survey of your needs now so that your filters may be ready to combat late summer drouth conditions.

NORWOOD ENGINEERING CO.
16 No. Maple St. Florence, Mass.

NORWOOD

FILTERS - CALENDERS - PLATERS - DUSTERS - RAG THRASHERS - FOLDING MACHINES - SUCTION BOXES

other large newsprint mill built on the banks of the Manchester Ship Canal, which it is hoped to complete by the end of this year.

Large scale amalgamations on the part of manufacturers continue. Arrangements have now been completed for the acquisition by Wiggins, Teape and Co. (1919) of the ordinary shares of Portals (John Allen & Son) and Roughway Paper Mills, and the ordinary and deferred shares in W. Howard & Son; all papermaking companies.

Shareholders of the Inveresk Paper Co. have received along with the accounts for 1929 the report of Mr. B. H. Binder, the well-known accountant who was recently elected chairman for the purpose of making an expert investigation. Mr. Binder regarded the principal contributory causes of the existing situation as being (1) the substantially increased floating debt created to provide for permanent expenditure, such as purchase of controlling interests in other companies, capital outlay on plant, machinery, etc.; (2) the distribution in dividends of practically the whole of the revenue of the company and various subsidiary companies without making adequate reserves, thus depleting working capital, and (3) the purchase of properties without proper investigation or regard for intrinsic values.

The Lord Mayor of London, the Norwegian and Finnish Ministers, and the Consuls-General for Norway, Sweden, and Finland, were among the guests of the Papermakers' Association of Great Britain and Ireland, at the annual dinner, when John D. Tod, the president of the association was in the chair. The Lord Mayor, proposing the toast of the association, said that trade generally was in a rather difficult position to-day, but some branches of the papermakers' trade seemed to have benefited considerably by certain legislation, for he noticed that unemployment had decreased, that overseas trade had increased, and that the imports in the wrapping section had resulted in the Treasury benefiting by £500,000. The president, in reply, said that he could not remember any year in which so many new machines had been erected in mills. It had been a year of progress. The wrapping paper trade had benefited by safeguarding and more money had been spent on new machinery in that branch of the industry, and the output had been increased in the old mills by forty per cent, while the price of the paper had been reduced by anything from twenty per cent.

Considerable interest has been aroused by the fact that the Government Ordinance Survey has produced its first map on waterproof paper. Suggestions have been made in some newspapers, more or less in humorous vein, that newspapers might very conveniently (from the point of view of the reader) be produced in this same material.

Sheeted Cotton Cellulose in Demand for Viscose Process

Sheeted cotton cellulose, the newcomer in the viscose rayon raw materials field is finding a widening market. Production of sheeted cotton cellulose at the Hopewell, Va. plant of the Hercules Powder Co. has shown a large gain since the installation of the modern paper machines there last fall, according to officials of the Virginia Cellulose department of the Hercules company.

Until quite recently wood pulp has been used almost exclusively as the basic raw material in the manufacture of viscose rayon. The use of cotton pulp in conjunction with wood pulp has been found to give improved characteristics to the rayon yarn, the cotton linters are now furnished in sheets so that they may be used in the same type of equipment as wood pulp. The latter has always been produced in sheet form.

The addition of cotton pulp has been found to increase the strength of rayon yarns, an important factor in the production of low denier and multifilament yarns. A yarn of considerably whiter appearance is also obtained, it is stated by manufacturers. As uniform raw materials are essential to the

Angle Compounds are favorites, not only in foundries, but in manufacturing, utility, railroad and engineering installations the country over. Their exact balance, compactness, low over all cost and high efficiencies are unique.

2500 feet of air needed to meet varying demand!

This foundry has just installed its fifth Balanced Angle Compressor

TWELVE years ago, a large foundry in Boston installed its first Balanced Angle Air Compressor, selected for its manifest advantages in power and upkeep economy.

Four years later, Balanced Angle No. 2 was added, based on the performance of No. 1.

In 1923 and 1926 additional, larger Balanced Angles were installed. In 1930 one of the small machines was replaced by another large Sullivan. Today the capacity of the air power plant is approximately 2500 feet, and consists of four units.

These compressors are individually driven by electric motors with short-center belt connection. One, two, three or all four may be operated at a time, according to the demand for air.

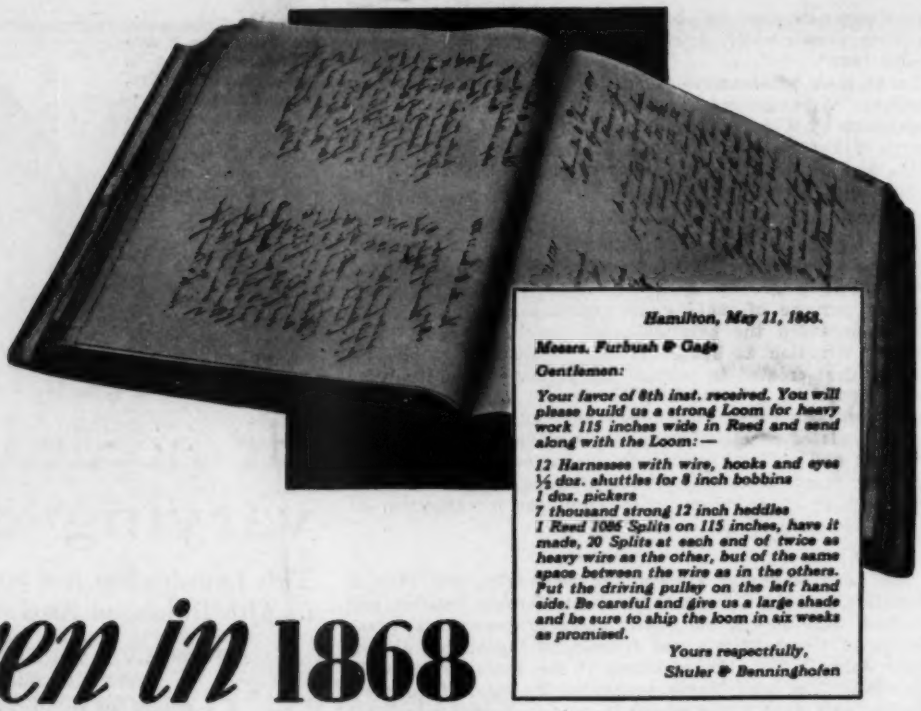
Have you investigated Sullivan compressors? Capacities 68 to 5100 cu. ft. All drives. Catalogs on request.

SULLIVAN

Sullivan Machinery Company

716 Wrigley Bldg., Chicago 30 Church St., New York

Four Balanced Angle Compressors in the power house of the Hunt-Spiller Manufacturing Corporation, South Boston, Mass., described above.



Hamilton, May 11, 1868.

Messrs. Furbush & Gage

Gentlemen:

Your favor of 8th inst. received. You will please build us a strong Loom for heavy work 115 inches wide in Reed and send along with the Loom:—

12 Harnesses with wire, hooks and eyes
½ doz. shuttles for 8 inch bobbins
1 doz. pickers
7 thousand strong 12 inch heddles
1 Reed 1086 Splits on 115 inches, have it made, 20 Splits at each end of twice as heavy wire as the other, but of the same space between the wire as in the others. Put the driving pulley on the left hand side. Be careful and give us a large shade and be sure to ship the loom in six weeks as promised.

Yours respectfully,
Shuler & Benninghofen

Even in 1868

Quality was building a business

The business of Shuler and Benninghofen was founded back in 1858 by two young men, Asa Shuler and J. W. Benninghofen.

And, for a time, as in all young businesses, there was a struggle to make ends meet. Paper mills had their accepted sources of supplies so it was not always easy to "get in."

But mills who tried the Hamilton Felt began to come back for more. Soon other mills began to get in line, because of the reputation for quality which this new brand of felts was making. We now see Shuler and Benninghofen writing that they could not fill orders immediately, there were so many others ahead.

In going through the copy books of those periods we find also such letters as that above—orders for an additional loom, for more harnesses, shuttles, pickers, and other equipment needed in the mills.

Seventy-two years later, the descendants of those two men are still making the quality felts as did those pioneers back in 1858. But felts immeasurably better.

Why should they not be better, with all this additional experience to build into them.

For it is this experience that dictates the choice of the wools and the proper mixing of them, the method of combing and carding, of weaving and fulling that assure you of felts with all the qualities you want—long life, economical cost, large water removing qualities, and good production of good paper.

Try a single Hamilton Felt, put it to any test you think a felt ought to undergo. Compare it with the results you have been getting. Then you will use Hamilton Felts on all your machines.

Shuler & Benninghofen, Hamilton, Ohio

Miami Woolen Mills

ESTABLISHED 1858

Hamilton Felts are marked by two blue lines full width of the felt and by one shorter blue line midway between them.

Hamilton Felts

rayon producer, the new cotton linter pulp is widely adaptable, its production being chemically controlled within narrow limits.

In the manufacture of rayon by the cellulose acetate, cuprammonium, or nitrocellulose processes, purified cotton linters are used in loose form.

◆ NORTHERN NEW YORK ◆

Statement Reveals Large Holding by St. Regis

St. Regis Paper Co. reports consolidated net income for the year ended Dec. 31, 1929, of $4,664,873, equivalent to $1.29 a share on 3,355,616 shares of $10 par value common stock, representing the average number of shares outstanding during the year. After the payment of preferred stock dividends totalling $329,497 and common stock dividend totalling $2,788,750, there was a balance for surplus of $1,546,626.

The company's balance sheet as of Dec. 31, 1929, reveals the ownership by St. Regis Paper Co. of 4,250,366 shares of common stock and 1,025,566 Class A option warrants of Niagara Hudson Power Corp. These were largely obtained through exchange of its stock holdings in Northeastern Power Corp., in which it owned a common stock interest of more than 52 per cent and have been supplemented by the purchase of additional stock. The investment in Niagara Hudson is carried in the balance sheet at $27,979,956, whereas its market value as of Dec. 31, 1929, was $55,650,000 and its present market value is substantially above the latter figure. The company's investments show an increase during the year from $23,379,342 to $32,050,791, the increase in book value of its holdings in Niagara Hudson over its investment in Northeastern Power accounting for nearly $6,000,000 of this gain. The property account, representing lands, buildings, machinery, equipment, timberlands, waterpower rights, patents, licenses, etc. is stated as $41,104,964, an increase of more than 100 per cent over the value of $20,164,049 assigned as of Dec. 31, 1928. This increase is due chiefly to the acquisition during 1929 of the assets of the Bates Valve Bag Corp. and subsidiaries. Current assets of $11,011,604, including $4,739,223 cash, compared with current liabilities of $2,448,619. Total assets are up from $54,031,732 to $86,447,999.

Net income reported for 1929 does not take into consideration the undistributed earnings of Niagara Hudson Power Corp. applicable to the company's holdings, which, if included, would add 27 a share, bringing the total up to $1.56 a share on the average number of new shares of St. Regis Paper Co. common outstanding during the year. F. L. Carlisle, president of the company, in his remarks to stockholders, reports that as a result of the acquisition during the year of the Bates Valve Bag Corp., in which connection the additional stock was issued, St. Regis is now an outstanding factor in the manufacture of multi-wall paper bags and filling machines for the packing of cement, lime, gypsum and other rock products.

Utica has been selected by the newly formed Walrath-Dorn Paper Co., Inc., as a site for a warehouse. This company is incorporated with a capital of $50,000 and will deal in high grade papers, paper goods and cordage. The officers of the company are Frank H. Walrath, Rochester, president; Lester A. Dorn and Dwight E. Vicks, vice presidents, and Sidney L. Dorn, secretary and treasurer. All members of the firm have long been associated with the paper industry. Sidney Dorn and Mr. Walrath will make Utica their residence. Mr. Vicks, president of Vicks Brothers, Inc., a printing company of Whitesboro, and Lester Dorn, head of the firm of Lester A. Dorn & Son of Johnstown, paper box manufacturers, will continue with their respective firms.

Announcement is made that George E. Taylor has been elected vice president of John C. Wiarda & Company, a division of the Kalbfleisch Corporation.

RYERSON

IMMEDIATE STEEL FOR MAINTENANCE AND REPAIR

When something breaks . . . and steel is needed in a hurry . . . you can depend upon Ryerson for quick action. Complete stocks of all steel products, including:

Bars	Wire	Babbitt Metal
Shapes	Chain	Tool Steel
Structurals	Turnbuckles	Bar Iron
Rails	Shafting	Refined Iron
Plates	Boiler Tubes	Floor Plates
Sheets	Boiler Fittings	Safety Treads
Rivets	Corrugated Sheets	Small Tools
Bolts	Concrete Reinforcing	Machinery
Nails	Welding Rods	

Write for the Journal and Stock List—the "key" to Immediate Steel.

JOSEPH T. RYERSON & SON INC.

Chicago Milwaukee St. Louis Cincinnati Detroit
Cleveland Buffalo Jersey City Philadelphia Boston

STEEL

THIS
is the way to ship paper!

These men are tightening and sealing the Signode Steel Strapping on the top of a skid shipment of Paper. Signode makes it safe to ship on skids with remarkable saving in handling and shipping time at both ends of the trip. Signode is also used to reinforce boxed paper shipments and permits lighter lumber at a distinct saving in box cost and freight. Check up—ask for a Signode Shipper or write for "Guide to Better Packing and Shipping".

SIGNODE STEEL STRAPPING CO.
2608 N. Western Ave. Chicago, Ill., U. S. A.
CANADIAN STEEL STRAPPING CO., Ltd.,
Montreal, Quebec
Offices in Principal Cities

SIGNODE
The Sealed Tensional Strapping

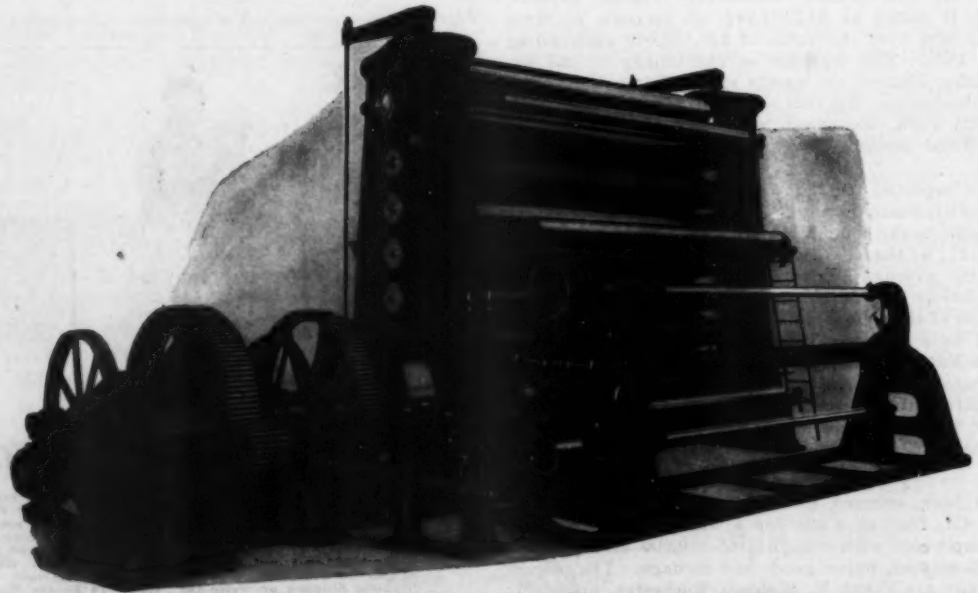
We also furnish round wire tensional reinforcements, all forms of nailed-on strapping, automatic wire tying machines, pail clasps, clutch nails, tag fasteners, etc. Write for general catalog.

HOLYOKE

SUPER CALENDERS *and* Experience

Experience does not come over night,—not in the designing and building of Super Calenders. It is the result of long years of intimate study of the daily dozens of difficulties to be overcome in the Paper Industry. For 65 years the HOLYOKE MACHINE COMPANY has built Quality and Superior Performance into every HOLYOKE MACHINE. When planning purchases of equipment consult with HOLYOKE Engineers, Holyoke Machine Co., Holyoke, Mass.

Manufacturers of Super Calenders, Platers, Cotton and Paper Rolls, Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors.



The HOLYOKE MACHINE COMPANY

FOUNDED 1863

❖ NEW ENGLAND ❖

New Power Plants

Several paper companies are installing power plants in this section. It is understood that the Combustion Engineering Corp., is to furnish equipment for a powdered coal unit at the Berlin, N. H., plant of the Brown Co., to fire a 1,000 hp. boiler. The Fitchburg Paper Co., at Fitchburg, Mass., is to install two No. 4 Riley Atrita pulverizers under a 1,160 hp. Bigelow Connolly boiler. This is to displace two hand-fired boilers. The boiler will be equipped with Foster Wheeler economizers and will operate at 300 per cent of rate at 250 pounds steam pressure. The pulverizers themselves will require 1,000 hp. A unique supplementary power supply is to start initial operations of the Maine Seaboard Paper Co., this coming winter. The New England Public Service Co., Insull owned, has purchased a vessel, the Jacona from the Shipping Board. It is being reconstructed for use as a floating power plant and according to Walter Wyman, president of the utility, can be so constructed at 75 per cent of a land station cost, besides being portable for service where power needs are greatest. It will house a 20,000 kw. oil burning steam plant and will go into service at the Maine Seaboard Paper Co., newsprint mill, subsidiary of the Public Service Co., at Bucksport, Me. It will relay at first, power from the new Bingham hydroelectric station also being constructed by a New England Public Service plant.

In so far as power for the Maine Seaboard Paper Co., is concerned, besides the electricity delivered from outside, its own power plant has been built to operate on oil or powdered coal. A three year contract on fuel it is understood, is to be signed at an attractive figure as compared with coal. The Maine Seaboard is able to take this and any other raw material by water and from large deep draft vessels, direct.

Protest by New England interests against the American Scantic Lines action in establishing a rate of $4.55 per ton on wood pulp from northern Europe to Portland and Boston, as compared to $4.50 per ton from the same ports of origin to Hampton Roads, especially Baltimore, has not resulted very favorably. The Steamship company has pointed out that the costs of cargo handling at Portland are materially higher than at the southern ports and inferentially the same is said to be true of Boston. A vessel can be discharged on one day less time at Baltimore it was pointed out.

Dr. Hugh K. Moore, chief Chemist and director of Research for the Brown Co., Berlin, N. H., who has been discharged from a Manchester, N. H. hospital, after an illness, took steps immediately to correct the impression that he had retired from the race for the Republican nomination for governor of the Granite State. He is still decidedly a candidate.

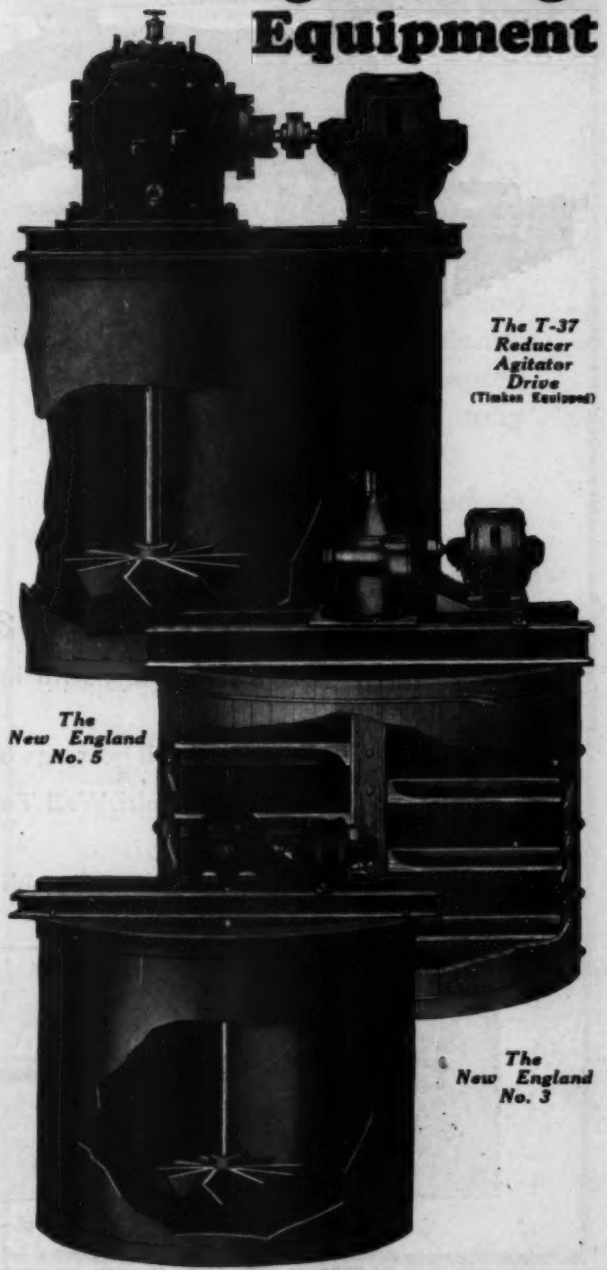
Expansion of the paper traffic between Boston and Philadelphia via the M.&M. coastwise lines is indicated in recent current reports. Dill & Collins Co., is shipping John Carter & Co., its local agents, in this manner and the service has been found very effective. Rutter & McNaught Inc., local paper merchants are receiving Champion coated seconds from Garret Buchanan, Philadelphia, in the same manner.

Massachusetts Bureau of Labor and Industries reports for March show that in 26 Holyoke manufacturing establishments there were 6,239 employees at work compared to 8,437 as a figure for normal of which number employed 2,159 were on full time. For the 26 establishments this was a slight decline from February. However, there are several other industries besides paper in the city which may have brought down the average.

The same bureau analyzing employment data by industries shows that in March there were 6,640 employees at work

for fillers—sizes—colors use

New England Agitating Equipment



The T-37 Reducer Agitator Drive (Timken Equipped)

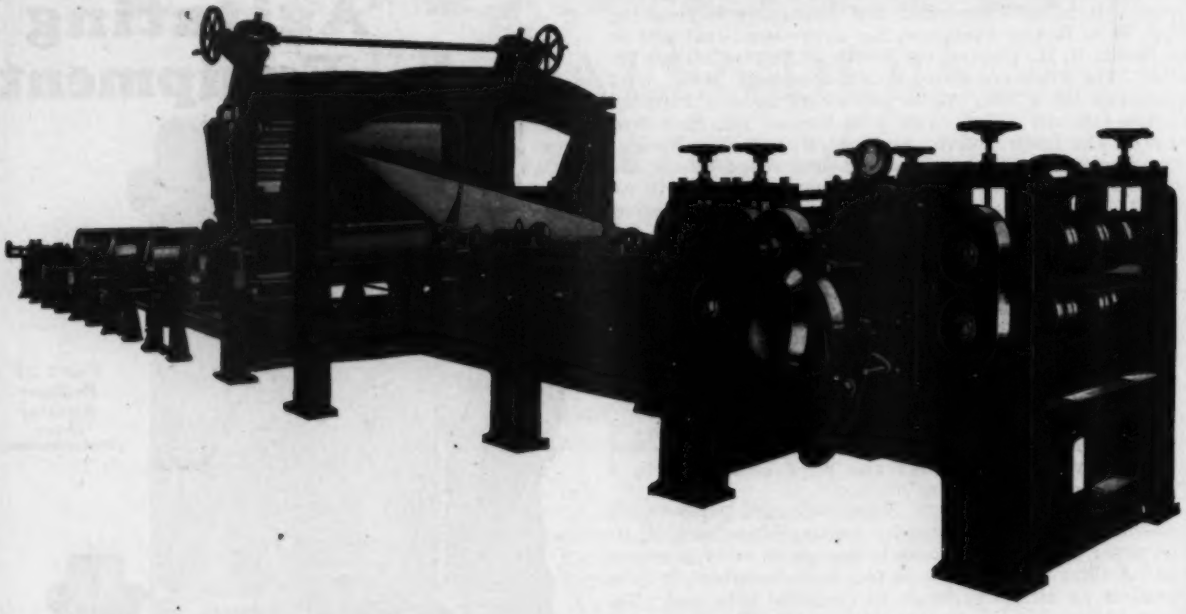
The New England No. 5

The New England No. 3

Ready to put to work—strong rugged units designed to operate with maximum efficiency and economy. Send for complete details and specifications.

The New England Tank & Tower Co.
Everett, Mass.
30 Church St., New York

PAPER BAG MACHINERY



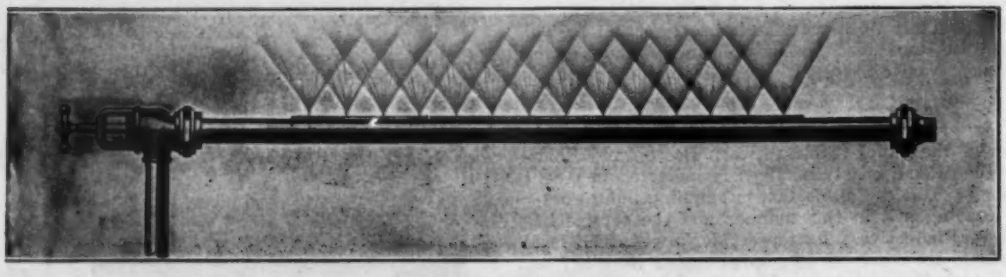
Multi Wall Tuber

For production of sewn bags, with intucked sides, with one up to five walls in thickness.

Modern in construction. All bearings of ball or roller type, entirely enclosed.

The tubes made on the Multi Wall Tuber meet the severest tests of perfection and production.

Write for further information—no obligation.



The Rain Storm Shower Pipe

The Smith & Winchester Mfg. Co.

ESTABLISHED 1828

South Windham, Conn.

PAPER MACHINERY — PAPER CUTTERS — PAPER BAG MACHINERY

in 28 reporting paper and pulp mills of which 6,025 were on full time, this being however for mills throughout the state. Moreover, in these 28 plants normal employment would be 6,816.

Eastern Manufacturing Co., is putting out Atlantic Bond in new, more striking colors, with the intention of making each shade sharply individual to enhance the value for forms etc.

The New England Paper Merchants Association is inviting a representative group of the industry to its annual spring meeting which will be held May 13th and 14th at the Hotel Kimball, Springfield, Mass.

Raw Materials

It is reported in the Boston market that leading consumers of old rope have reduced prices to 3.50¢ per pound on foreign ex dock, and 4¢ on domestic. This is the second cut initiated by the large consumers in this section within a month and is accounted for by quiet business as well as substantial supply. Contract time for coal in April found many mills deciding to purchase their 1930-31 fuel on a month by month basis. Mine run New River closed the month at $5.50-$5.60 Boston, nut and slack at $5.10 to $5.20 Boston. Waste paper was down 50¢ per ton at $5 for mixed Boston, on May 1, and book stock $1 per ton off at $1.35-$1.40 Fitchburg for May shipment. Distress strong unbleached sulphite was offered at 2.50 dock Boston, but shipment pulp was fairly steady. New England board mills closed kraft contracts at 2.05.

A new flooring warehouse is under construction at the plant of Bird & Son at Norwood, Mass. The same manufacturers are planning an appropriate dedication of their 500 millionth shoe carton which will be out soon.

The Boston Federal Reserve Bank covering the New England States reports fundamental credit conditions sound as of April, but notes a drastic decline in loans to member banks as compared to a year ago, $19,000,000 this year and $72,500,000 a year ago.

Plans for a proposed new power plant for Hollingsworth & Whitney Co., have not been formulated sufficiently to announce details, type of equipment, etc.

Horation W. Southworth, born in 1839, died early last month at Boscombe, England. He retired in 1914 as treasurer of the Southworth Paper Co., Mittineague. Mr. Southworth was the son of Wells Southworth, who with Edward Southworth, founded the company which bears their name. He was a prominent factor in the development of fine papers in Western Massachusetts during the latter quarter of the past century.

Charles C. Davis, vice president of Whiting & Cook Co., Holyoke, and for many years connected with Eaton Crane & Pike, died in Pelham Manor, N. Y., April 7.

E. H. Sussenguth has been officially appointed as Boston representative of the American Writing Paper Co., with offices at 80 Federal street, succeeding George McCarthy, who passed away recently at Rutland, Mass.

Arthur V. Howland, vice president and managing director of Tileston & Hollingsworth Co., returned last month from a European trip with Arthur Holbrook, English China Clay Sales Corp. Mr. Howland visited several foreign mills. He expressed the belief that direct selling is growing because of hand-to-mouth buying, inadequate stocks of middle houses, and because of short distances abroad, and store door deliv-

ORR

Quality Felts

Orr weaves fine felts with which to meet the many and varied felting requirements, and can furnish a felt adapted to any condition you may describe.

Orrs are helping to produce better stock thru greater rapidity and efficiency in dehydration—cutting costs because of longer wear and less time out for washing.

Whenever a product stands out in its particular field you can invariably trace the reason straight back to quality. If not acquainted with Orr quality, send your next order to Piqua and compare the results.

The Orr Felt & Blanket Co.
Piqua, Ohio

FELTS

Reliance Adjustable-speed Motor-drive for Paper Cutters

Photo—Courtesy of Champion Coated Paper Co.

Group of Hamblett Cutters with Moore & White Lay-boys individually driven by 5 hp. 800-1600 r.p.m. Reliance Motors. These cutters were formerly belt-driven. The change to motor-drive resulted in a production increase of over 25%.

The motors and controllers in this installation are mounted on a platform above the lay-boys. This arrangement saves space and makes it easy to inspect all the electrical equipment.
The motor speeds are easily controlled through the rheostat at the operator's left. Starting and stopping are controlled by a push button at the right.

Adjustable-speed motor-drive helps in the cutter room because every change in conditions that can affect the output of the cutters can be quickly met by simply pressing a button or turning the handle of a rheostat.

Although the need for such a flexible control may seem slight, the results often prove highly profitable. A slight increase in the daily output soon compensates for any initial outlay and continues to pay big returns.

By using adjustable-speed motors, just the right speed can be obtained to suit sheets of any size and weight and grade of paper.

There are fewer paper breaks because the tension on the web of paper is constant throughout all operations.

Complete shut-downs due to line shaft troubles are eliminated as each cutter operates as a separate unit.

RELIANCE ELECTRIC & ENGINEERING CO., 1058 Ivanhoe Road, Cleveland, Ohio

Branches: Birmingham, Boston, Buffalo, Chicago, Cincinnati, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, St. Louis, Toledo.
Representatives: Denver, Kansas City, Knoxville, Minneapolis, Los Angeles, San Francisco, Seattle.

RELIANCE A-C D-C MOTORS

ery of British railroads which facilitated development of this method. Mr. Howland took motion pictures of china clay production and loading at Fowey, England, which will be shown at the Paper Division of the New England Purchasing Agents Association at Commonwealth Country Club on May 12th.

T. K. Davis, at one time with Claremont Paper Co., Boston, and more recently with Price & Pierce Ltd., of New York, has accepted a position as manager of sales for Nashua River Paper Co., East Pepperell, Mass., and has taken up his duties as of May 1st.

B. Milton Kimball and Roger Q. Pease whose retirement from Nashua River Paper Co., and consequent attachment of that mill's property created wide trade interest and who subsequently joined Gilman Paper Co., Gilman, Vt., announce that they have been given full charge of manufacture and sale of "Green Mountain Kraft" a Gilman product. This company also makes newsprint, bags and specialties and it is reported is considering a southern plant.

A New England export conference on May 14th will consider foreign markets. New England paper manufacturers and converters will be represented. The meeting is under the auspices of the New England Council.

Otter River Board Co. has secured a rate on binders board from Otter River, Mass., to Washington, D. C., not to exceed by 2c per 100 pounds the rate to Baltimore. This is apparently based on differentials established on other grades of paper to Washington over Baltimore.

It is probable that hearing will be held at Washington rather than Boston on the complaint of the New England Paper & Pulp Traffic Association and the state of New Hampshire, against all rail coal rates from Pennsylvania to New England. Unreasonably high rates are alleged. The hearings may be held next month.

Boston Club of Printing House Craftsmen provided a highly entertaining burlesque on the annual calendar analysis of Tileston & Hollingsworth Co., at the annual Craftsmen meeting April 28 at the Boston Chamber.

Maine Coated Paper Co., division of Oxford Paper Co., Rumford, Me., have placed a new folding coated on the market to meet conditions where economy is important but where stock must fold and print well. Its trade name is Mainefold.

Dr. Richard L. Rice, New England regional sales manager of the Brown Co., Berlin, N. H., addressed the salesmen of Carter Rice & Co., May 3, discussing many of the company's new papers. At an earlier sales meeting in April, Charles Dodge, International Paper Co., discussed offset papers before the sales and executive staff of the same merchants. Mr. Dodge emphasized the need of offset papers specifically made for the purpose, with hard sized surfaces for best results for this type of printing.

Terry Steam Turbine Announces Appointments

Announcement is made that J. D. Stout has been elected vice president of the Terry Steam Turbine Co., Hartford, Conn. Mr. Stout has been associated with the company since 1909 in connection with engineering and sales activities. For several years past he has been manager of the New York office.

T. G. Hart of the Terry Company has been promoted from manager of the Chicago office to the position of general sales manager. Both Mr. Stout and Mr. Hart will hereafter be located at the home office of the company at Hartford.

TRY THIS TEST OF SURFACE ADAPTABILITY

THE term "surface adaptability" may be new to transmission. It means that a belt surface conforms, in all respects, to the pulley surface—just as the palm of your hand tends to conform to the surface of a piece of glass when it is pressed against it. The greater the surface adaptability, the greater the pulling power—if backed by strength.

Make this simple test:

Press a piece of VIM Leather against the underside of a sheet of glass and see how VIM takes hold of even the smoothest surface. Compare this "pulley view" to other types of belting. See for yourself why VIM pulls more.

The instant adaptability of VIM Leather to the pulley surface is one of the secrets of the remarkable pulling power of VIM. It allows VIM Leather to take hold of the pulley at lower tension than any other belt. That's why VIM Leather Belting is universally known as "the belt that puts the pull in pulley."

LEATHER VIM BELT

VIM is a product of the Houghton Line

E. F. HOUGHTON & CO.

PHILADELPHIA, PA. *And all over the world*

Over Fifty Years

Experience in the manufacturing of wires for American and Foreign paper makers and the ever increasing use of Appleton Wires testify to their quality.

Looms of our own design, wire drawn in our own plant to specifications derived from exhaustive research, and carefully trained operators make this high quality possible.

Appleton Wires

are good wires

APPLETON WIRE WORKS INC., APPLETON, WIS.

PACIFIC COAST

WASHINGTON

Crown-Zellerbach Corp. has taken an option on a mile of water front at Port Townsend, as a site for a paper bag mill, according to recent report. The land is near the plant of the National Paper Products Company. It is said that the new plant would employ about 300 persons.

Further development in the pulp industry around Raymond is indicated in the purchase of a site at the Southwest Shingle mill for interests represented by A. W. Hammond of South Bend. It is understood that the purchase price was about $20,000 for the land which includes 19 acres and water frontage of 1,400 feet. A 75-ton pulp mill to employ 75 men is in prospect for early construction, according to report.

Hawleys to Build Mill at Kalama

W. P. Hawley and W. P. Hawley, Jr., who until recently held the controlling interests in the Hawley Pulp & Paper company of Oregon City and the St. Helens Pulp and Paper company, St. Helens, Oregon, have completed plans for construction of a plant probably at Kalama, which will cost over $3,000,000. This announcement made by Hawley, Jr., substantiates the persistent rumors to this effect which have been heard since early in the year, that the Hawleys would build along the Columbia river at a point in the vicinity named.

Tentative plans include a 150-ton bleached sulphite plant and a kraft mill of 150-ton capacity, general construction to start during the summer when a site is definitely decided.

Don S. Leslie, assistant sales manager of the Hammermill Paper company of New York City, has been visiting plants and offices of the company in the northwest.

OREGON

New Chemical Plant Operating Successfully

Operations of the newly opened plant of the Paper Makers Chemical corporation in Portland will continue to expand in the next few years according to William J. Lawrence, president of the company with headquarters in Kalamazoo, Mich., who has been spending sometime at the Portland plant. This latest addition to the chain of plants of this company now makes 20 units operated in the United States and Canada, all of which have for their principal product a water-proofing compound for manufacturing hard surface paper.

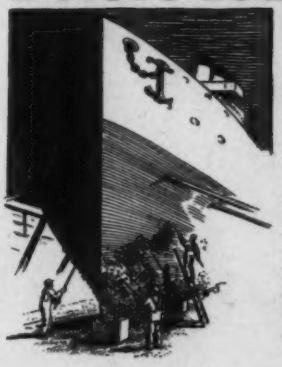
Orders for the Orient which have previously been shipped from the mills in the South are now to be supplied from the Portland plant. Mr. Lawrence states that the pulp mills of China and Japan will offer an increasing market for the chemical product produced by his company.

At present the new plant is using 40 to 50 carloads of resin a month which is being shipped by steamer from the South but it is expected that these shipments will be considerably increased with the expansion of territory served. The plant is now supplying all the paper mills of Oregon and Washington and is the only plant of its kind on the west coast of the United States.

Alec C. Duncan is manager of the Portland plant and accompanied Mr. Lawrence on a tour of Oregon paper mills during his stay in the state.

Portland school students used "home-made" examination paper for the first time in their spring exams. when the first product of Oregon mills was introduced. This paper was made by the Western Paper Converting Co. of Salem from the product of the Oregon Pulp & Paper Company's plant also in that city. Heretofore, such school supplies have come

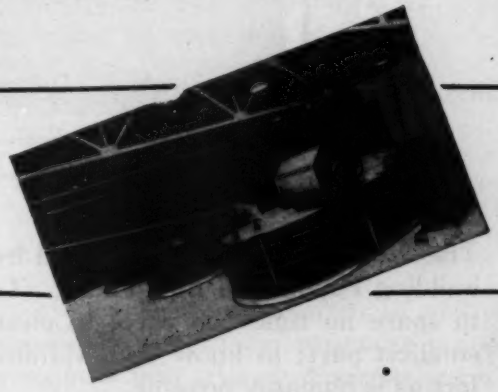
Remove the Barnacles Before You Put to Sea



They scrape off the barnacles and overhaul the machinery between voyages — not after they clear port and make for the open sea — too busy then to fool with repairs!

What's to keep a paper maker from learning from those who guide the destiny of our great liners? Why shouldn't a mill superintendent "remove the barnacles" and tune up his equipment NOW, while business is a trifle quiet—get ready NOW for the "sailing orders" that are bound to come?

If you are going to need more beating capacity *then*, put in those Mid-Wests *now*. If your present line-up is in need of overhauling only, do the job right while you're at it—make them over into the Mid-West High Speed type. But, whichever you do, do it NOW, when down time interferes less with production than it will later on.



And finally, be sure to have Mid-West engineers submit their estimates before letting the contract. They have something extraordinary to offer, both in design and price.

The Mid-West Machine Co.

Dayton, Ohio

Pacific Coast Representative

MR. JAY PLATT HAMERSLAG,

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MID-WEST

Paulson Barking Drum

This Company has been actuated by one undeviating incentive in designing and building Paper Mill Equipment: To design and build as finely as can be done; to spare no time—no care; to eliminate the element of chance from even the smallest part; to know that Manitowoc Paper Mill Equipment is as nearly perfect as is humanly possible.

Write for full information.

Designers and builders of —

Barking Drums	Incinerators
Sulphite Digesters	Disc Evaporators
Experimental Digesters	Air Nozzles
Globe Rotary Digesters	Diffuser Tanks and Swing Pipes
Cylindrical Digesters	Bleach and Clay Mixers
Rotary Lime Kilns	Rod Mills

Moore Crawler Speedcranes, Shovels, Draglines and Trenchoes

MANITOWOC ENGINEERING WORKS

Manitowoc, Wisconsin

from eastern factories. The paper was ruled and produced after a standard set by school authorities. Portland jobbers are handling the new line for distribution.

J. F. Galbraith is heading a company which it is said will construct and operate a plant at Salem for the manufacture of paperboard products. Although the financing is just started, it is understood that the plant will cost about $40,000 with equipment.

New Fir-Tex Plant to Operate This Summer

The Fir-Tex Insulating Board Company's plant at St. Helens is fast nearing completion. It is thought that raw materials will be brought into the mill and operation started by July 1 of this year, although it will require about three months to train the workmen in production, so that probably no commercial operation will be featured until September, according to A. E. Millington, who with his son C. A. are the inventors and managers of the product to be produced.

It is estimated that the first unit of the plant will have an annual capacity of 75,000,000 feet of Fir-Tex board and lath. Paid up capital of the company is $2,500,000.

The great board machine specially designed is 166 inches wide. A battery of six huge rotary globe digesters 18 feet in diameter and having a capacity of 3,000 cubic feet each will be used in preparing the chipped wood for the shredding machines. All machines will be operated electrically by individual motors. The giant dryer is in eight decks 15x120 feet.

The board storage building is a separate all-steel structure 90x300 feet in size having railroad tracks through the center to facilitate shipment. The pumping plant has a capacity of 4,000 gallons per minute.

At the present time all concrete work, including 149,612 square feet of concrete floor, is completed. Steel sash and roof are installed and machinery is placed.

CALIFORNIA

Blake Moffitt & Towne's New Offices Completed

Blake, Moffitt & Towne, according to present plans, expect to get their Oakland division settled sometime this month in the new building which is under construction as offices and warehouse headquarters located at Sixth and Webster streets.

The building is two-story 135 by 75 feet in size, of re-inforced concrete and brick, providing 20,000 square feet of floor space. The latest facilities for handling freight and making deliveries were carried out in the plans for this new building. Offices and display rooms are on the first floor. F. L. Unthank is manager of the Oakland division.

The cost of the new structure is about $75,000. It is one of the finest paper establishments in its line on the coast, and is a fitting tribute to the company which is now celebrating its 75th anniversary, and which boasts 17 divisions in five western states. The new branch at San Diego has recently been opened.

The Pioneer Paper Co. of Los Angeles now has its new emulsion plant started through awarding of several construction contracts. The cost is set at $75,000 and it will be of mill construction type two and three stories.

Zellerbach Paper Co. is located in new offices at 343 Sansome street, San Francisco, with E. A. Breyman in charge.

Helmer F. Bryan has been appointed printing paper sales representative at Sacramento for the Zellerbach Paper Co., succeeding C. M. Christie, resigned.

A. C. Calkins, for the past two years associated as secretary and sales manager with the McClellan Paper Co. of Minneapolis, has moved to San Francisco and will be in the office of Blake, Moffitt & Towne. For seven years Mr. Calkins held a position with J. W. Butler Paper Co.

Away from its base weeks and months at a time, cruising in the Arctic, the Coast Guard Cutter Northland cannot risk the safety of its engineering equipment by the failure of pumps at sea . . . pumping equipment *must* be dependable.

8 Warren Centrifugals have given efficient, dependable service on every cruise.

For more than 30 years, Warren pumps have held the confidence of marine engineers because of their steady, reliable service under all conditions.

They will deliver the same service in your plant. Unusually low maintenance, economical to operate, they maintain their original efficiencies over a long period of time and give the user the lowest possible pumping cost per year. Write for Bulletins.

Warren Stuff Pump, built to handle 6% clean stock smoothly, efficiently and without clogging

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Agencies in All Principal Cities

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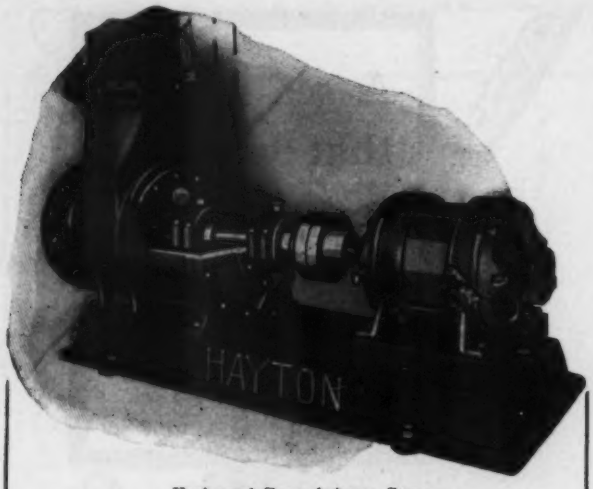

Horisontal Type Agitator Pump

CENTRIFUGAL PUMPS
AGITATOR PUMPS

The number of repeat orders for agitator pumps, which we have received during the past few months, is the best indication of the satisfactory service these agitators are giving.

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PAPER mill superintendents everywhere are finding Oakite Grinding Compound the ideal coolant and lubricant for grinding steel calender rolls. The remarkable efficiency of this compound helps to produce a surface free from blemishes of any kind. It prevents rusting when rolls are left wet overnight.

Not only for grinding, but also for washing felts, cleaning Fourdrinier wires, screen plates, and sieve cloths, Oakite materials are unequalled. Their safe, effective action assures complete cleanliness and longer life.

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Oakite Service Men, cleaning specialists, are located in the leading industrial centers of the United States and Canada

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By Harry Williamson

One of the greatest funds of information on paper making ever published for the mill man.

Part I contains the first twelve lessons and two separate articles—A Problem in Head Box Control and The Degree of Hydration.

Part II contains fourteen lessons and one separate article—Safety Practice in Machine Room. Price 50¢ each.

Practical Helps for the Mill Men

A 48-page pamphlet made up of practical helps, many of which have meant considerable savings in paper and pulp mills. Of tremendous value to the practical man. Price 50c.

THE PAPER INDUSTRY
333 N. Michigan Ave. CHICAGO, ILL.

United Paper Box Co. of San Francisco, reports for the year ending February 28, 1930, net earnings of $61,505.42, equal to $4.38 a share on B stock after payment of dividends of $1.60.

Paper men who spoke at the April meeting of the San Francisco Club of Printing House Craftsmen included T. A. O'Keefe of the Pacific Coast Paper company who spoke on "Cardboards and Bristols;" Lewis A. Colton of Zellerbach Paper Co., on "Coated Papers," and Charles Pritchard of Bonestell & Co. on "Book Papers." The meeting was held at Hotel Bellevue.

Arthur G. Towne

Arthur G. Towne, 73, formerly a member of the pioneer paper firm of Blake, Moffitt & Towne, died at his home in San Francisco recently after a long illness which had forced his retirement from business and from his position as president of the firm. He was the son of James W. Towne, who with Francis Blake and James Moffitt, founded the present company bearing these names.

Mr. Towne is survived by his widow; also two sons, James W. and Arthur W., who are both prominently identified with Blake, Moffitt & Towne.

Crown-Zellerbach Corp. notified its stockholders last month that all outstanding shares of convertible preferred stock of the issue of 1926 and 1927 will be called for redemption September 1, 1930 at $120 a share plus accrued dividends.

The General Paper Co. of Los Angeles has taken on for distribution the linen typewriter paper line manufactured by the L. L. Brown Paper Co. of Adams, Mass. General Paper Co. has recently been handling L. L. Brown Advance Bond.

Zellerbach Paper Co. of San Francisco, has taken over the paper business of Dixon & Crane, Stockton, with Guy E. Crane in charge of sales.

Blake, Moffitt & Towne have been appointed agents for Maxwell Bond made by the Maxwell Paper Company, Franklin, Ohio.

United States Paper Co. of Los Angeles, moved last month to new quarters at 1301 East Sixth street.

R. J. Gruenberg has been elected president of the Consolidated Paper Box Co. of San Francisco.

Plans for a conference of the Pacific States Trade Commission are well under way, the meeting to be held at Del Monte this month.

D. A. Fleischmann has succeeded W. S. Weaver, resigned, as manager of the Los Angeles branch of Bates Valve Bag Co.

Construction of a paper mill to convert rice straw into wrapping paper is said to be planned for Oroville, at a cost of $550,000.

ALASKA

John E. Blaine last year obtained a permit to cut timber along the Alaska railroad between Seward and Fairbanks after extensive aerial surveys had been made showing that pulp timber was prevalent in this tract. It is now reported by officials of the Alaska railroad that he will build a pulp mill and timber mill in the vicinity.

The Texas Company announces the removal of its New York offices to 135 East 42nd Street, New York City.

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CHIP SCREEN

Thorough removal of sawdust and fine particles!
Small floor space required!
Low power consumption!
Immense capacity!
Fully adjustable screening angle and vibration!
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No destructive shaking of supports or buildings!
No belts or pulleys!
Trouble-free operation!

These are the features which make the Wood Chip Hum-mer a profitable investment for pulp and paper mills!

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At AUSTIN, PENNA.—The Bayless Mfg. Corp.'s complete, up-to-date Paper Mill at fraction of its actual value.

At CHEBOYGAN, MICHIGAN, the Paper Mill of the Union Bag and Paper Corp., at a very low price. Exceptional water power contract offered by the Michigan Power Co.

At BUCK RUN, PENNA.—The Coatsville Paper Mills, Inc. 86" trim three cylinder machine. Good specialty mill, ready to operate.

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WANTED—Experienced Master Mechanic for Board Mill in Middle West. Give age, experience and references in first letter. Address Box 177, The Paper Industry.

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1—**WANTED**—Paper Mill Superintendent for Bond and Waxing 4 Machine Mill. Apply to **FRASER PAPER, LIMITED,** Madawaska, Maine.

2—**WANTED**—A few openings for recent graduates in Chemistry or Chemical Engineering. Apply to **FRASER PAPER, LIMITED,** Madawaska, Maine.

Each applicant to give following information:

1—Record of practical experience.
2—Record of technical training.
3—References.
4—Age.
5—Particulars of family.
6—Photograph.

NATIONAL FOREST TIMBER FOR SALE

Sealed bids will be received by the District Forester, Post Office Building, Denver, Colo., up to 2 P. M., July 2, 1930, and opened immediately thereafter, for timber, estimated to cut approximately 2,000,000 cords of pulpwood, on two areas on opposite sides of the Continental Divide in southern Colorado. One area includes about 150,000 acres within Tps. 38 and 39 N., R. 1 E., Tps. 37, 38, 39, 40 and 41 N., Rs. 2 and 3 E., T. 39 N., R. 3½ E. and Tps. 37, 38, 39 and 40 N., R. 4 E., all of N. M. P. M., Rio Grande National Forest, known as the South Fork Unit, estimated to cut about 1,240,000 cords of pulpwood, approximately 80 per cent Engelmann and blue spruces and 20 per cent white and alpine firs, together with unestimated but relatively small amounts of pines and Douglas fir to be cut at the option of the purchaser. The other area includes about 121,000 acres in Tps. 36, 37 and 38 N., R. 5 W., Tps. 36, 37, 38 and 39 N., Rs. 3 and 4 W., Tps. 37 and 38 N., R. 2 W., all of N. M. P. M. on the drainage of the Piedra River, San Juan National Forest, known as the Upper Piedra Unit, estimated to cut about 800,000 cords of pulpwood, approximately 65 per cent Engelmann and blue spruces and 35 per cent white and alpine firs, together with 110,000,000 feet B.M. of Douglas fir, 60,000,000 feet B.M. of western yellow pine, and 1,000,000 feet B.M. of limber pine, which Douglas fir and pines are to be cut at the option of the purchaser.

No bids will be considered which offer less than:

For the timber on the South Fork Unit, $1 per cord of unpeeled pulpwood of spruces, white fir and alpine fir, and at least twice the cord rate per M feet B.M. for material of these species taken out in sawlog form, and $2.50 per M feet B.M. for Douglas fir and all species of pines. For the timber on the Upper Piedra Unit, $.75 per cord of unpeeled pulpwood of spruces, white fir and alpine fir and at least twice the cord rate per M feet B.M. for material of those species taken out in sawlog form, and $2.00 per M feet B.M. for Douglas fir and pines. Separate bids must be submitted for each unit, but the right is reserved to award on the basis of the most advantageous offer for both units, or to reject any bid for either unit, or to reject all bids. Agreement, as part of any bid, to take all or specified amounts of the optional species may be considered in determining the most advantageous offer.

$30,000 must be deposited with each bid on the South Fork Unit, and $25,000 must be deposited with each bid on the Upper Piedra Unit, to be applied on the purchase price, refunded or retained in part as liquidated damages according to the conditions of sale.

Before bids are submitted, full information concerning the timber now offered, the reservation of additional areas, the showing of financial responsibility required of bidders, the other conditions of sale, and the submission of bids should be obtained from the District Forester, Denver, Colo., or, for the South Fork Unit, from the Forest Supervisor, Monte Vista, Colo., or, for the Upper Piedra Unit, from the Forest Supervisor, Durango, Colo.

Vincent G. Hazard

Vincent G. Hazard, a veteran in the employment of the Pusey and Jones Corporation, Wilmington, Del., died at the advanced age of seventy-seven in his home at Claymont, Del., on Sunday, April 13. He had served for more than two-thirds of his lifetime with the firm and was perhaps one of the best known and highly respected men in the paper machinery manufacturing industry throughout the world. At the time of his death he was head of the drafting room force of the Pusey and Jones plant and was editor of The Super-Calender, house organ of the Pusey and Jones Corporation. As head of the drafting room, he came in close contact with all the erecting engineers who of course, worked to the drawings which he made or supervised. He not only designed papermaking machines but he also made the drawings by which many of the mills were erected. As examples may be mentioned the mills of the Wanaque River Paper Company, the York Haven Paper Company and the Hammermill Paper Company.

On the occasion of his fiftieth anniversary with the company, Mr. Hazard received a number of splendid testimonials. The most elaborate was a beautiful leather-bound portfolio, containing his picture and that of the donor, Ernst R. Behrend, president of the Hammermill Paper Company, at Erie, Pa., and was sent to him by special messenger. Mr. Behrend was a member of the drafting room at the Pusey and Jones Company for several years before Hammermill was built, and was closely associated with Mr. Hazard. In his tribute, he said, "No ordinary man serves a company for fifty consecutive years. No ordinary man succeeds in building up in the hearts of men who have worked under and with him a sense of appreciation, respect and deep feeling of gratitude such as exists in mine for Vincent G. Hazard."

It is interesting to learn that Pusey and Jones entered the paper machine manufacturing field in 1867 through the burning down of the Rockland Mills of the Jessup & Moore Paper Company. William Luke, then superintendent and manager of these mills, who was later president of the West Virginia Pulp & Paper Company, went to the Pusey and Jones Company, which had made numerous repairs to their machinery, and requested the company to construct certain machines to replace others lost in the fire. Though this was new work for the firm, it started such manufacturing at the insistence of Mr. Luke. Since that time the company has attained a worldwide reputation in this field.

Born in Philadelphia in 1853, Vincine G. Hazard received his early education in that city and in due time passed the entrance examination for the Sheffield Scientific School at Yale University, from which he was graduated in 1874. Three years later, on April 26, 1877, he went to work at the Pusey and Jones Company plant, one of his first jobs being the preparation of plans for paper machines under the direction of Thomas H. Savery, who was then at the head of the paper machinery department of the company and admittedly one of the foremost designers of papermaking machinery in the United States.

Mr. Hazard was gifted with literary talent of a high order and he contributed numerous articles on papermaking subjects to independent paper industry periodicals as well as to The Super-Calender. Everyone knew Vincent G. Hazard and all had the utmost respect for him, not only for his character and personality but for his ability in the profession which he had made a life study.

The General Refractories Company, Philadelphia, has appointed Harry N. Crowder, Jr. Company of Easton, Pa., as its exclusive High Temperature Cement Dealer in Lehigh and Northampton counties in Pennsylvania, and those portions of Warren and Hunterdon counties in New Jersey adjacent to the Delaware river between the towns of Belvidere and Milford.

The Connersville Blower Co., Connersville, Ind., has moved its Chicago sales office to Room 1428, 20 N. Wacker Drive. Also the New York sales office is now located at Room 533 Graybar building, 520 Lexington avenue.

THE D. J. MURRAY MANUFACTURING COMPANY offers the latest type pulpwood Chipper for quality chips and low power consumption, having approved spout and knife angle, and new bed knife design.

We were the first designers and builders of Direct-connected to Synchronous Motor Chippers and have them running in steady operation. We were also the first to conceive the idea and build the Chippers with roller bearings. Our original installations are six years old and are still running at full capacity.

Our Chipper has the lowest maintenance cost of any Chipper on the market. Ask the man who runs one. Remember that the Murray Company has stood the test of time on its Chipper and that the same is a proven article. Why experiment with others? Any good article is always copied. Our Chipper is no exception. Why accept anything but the tried and proven original?

Why not cut the power costs and upkeep in half? This you can do and we will be glad to tell you how. Furthermore, by using the Murray Chipper, you will get a better chip which should be of considerable interest to you.

Our Chippers are made in various sizes with square or round spouts. Your request for further information will have our immediate attention.

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Technical Developments in the Paper Industry

Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Stock Density Regulator

THE stock density is maintained constant in a device in such a manner that the density indicator is coupled in simplest manner by means of an eccentric with an oil pressure regulator, whereat the correcting impulse is not actuated simultaneously therewith. The regulation of the compressed oil corresponds to a few grams difference in weight of the funnel contents, so that errors in regulation cannot occur in this device of transmitting power.

The instrument may be used on the line from one vat to another, or in the stuff chest itself or in a mixing process. In the first case, shown in Figure 1, the stock is moved

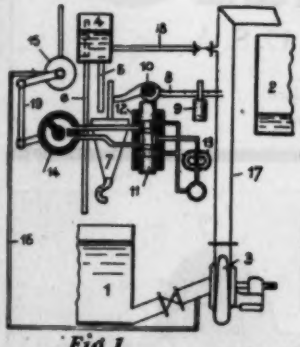

Fig 1

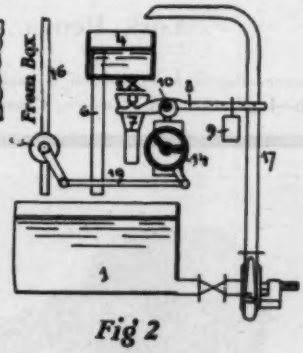

Fig 2

by the pump (3) from the box (1) to the box (2). The primary group consists of a container (4), to which a fractional part of the regulated flow of stock is continuously fed through the pipe (18), of the vertical outlet pipe (5), the overflow tube (6), the funnel (7), the balance arm (8), the eccentric (10) at the pivot of the balance and the adjustable weight (9). The secondary group consists of the regulating device (11), the housing for this device (12), the oil, pump with the motor (13) and the service motor (14). This motor controls the regulating disc (15) by means of the rod (19). The regulating principal of the primary group of parts depends on the well-known physical phenomenon that the speed of flow of a substance through a pipe depends on the density of the substance. The weight of material in the funnel (7) thus varies with the density. The impulse of the variation in this weight is carried over to the regulating valve of an oil pressure regulator by means of the eccentric located at the pivot of the balance arrangement. The oil pressure regulator together with the service motor controls the addition of diluting medium.

Regulation takes place, in the case shown in Figure 2, in the mixing box itself. This regulation is carried out in such a manner that a flow of stock is passed continuously through the regulating device by the pump (3), until the indicator comes to rest. It is important in this instance that a stirring apparatus should be constantly and effectively at work in the box during the process of regulation. Wochenblatt fuer Papierfabrikation, volume 60, pages 1538-41.

New Method of Sizing Paper

THE authors investigated the process of sizing paper with cold prepared size. It was found that the most favorable concentration of the sodium hydroxide solution used as a solvent was 0.5 per cent. The hardness of the water used in the plant made it necessary to increase the concentration of the sodium hydroxide to 0.54 per cent. The dissolving of rosin in caustic soda solution is a process much dependent on the temperature. The most favorable temperature was found to be 22 to 24 degrees C. and not 15 degrees C. as reported. The most favorable dissolving conditions, such as speed of circulation of the lye, size of the pieces of rosin, etc. were also determined. An apparatus was then designed based on this information. There were many difficulties encountered in perfecting the large scale process, but these were all overcome. The following results were obtained.

	Writing paper		Print paper	
	old method	new method	old method	new method
Rosin	4-4.3%	2.9%	1.5%	0.9%
Aluminum sulphate	5.6%	5.8%	1.75%	1.6%
Animal glue	0.14%	0.3%	0.05%	0.08%

The sizing results were entirely satisfactory and the saving in rosin was great. Doliwo-Dobrowolskij and Kagan, Bumaschnaja Promischlennost, volume 8, 10.

Quantitative Determination of Cellulose in Wood by a New Method

THE difficulties that arise in the determination of cellulose in wood and other raw cellulosic materials are due to the fact that oxidizing agents which are used to remove the pentosans and hexosans as well as the lignins exert a certain action on the cellulose itself, leaving it in a more or less changed state. This injury to the cellulose may be reduced by using dilute solutions, but when this is done the process is slowed up. In fact that duration of the process is so prolonged that it becomes infeasible for technical purposes. Various methods proposed and used for this purpose are discussed and criticized.

The author has found that the digestion of wood with a mixture of one volume of nitric acid and four volumes of alcohol in a flask provided with a reflux condenser quickly gives a cellulose, free from lignins and pentosans, and not materially injured itself. This method was used on various woods and found to be accurate. In two different pine woods the pentosan content was determined to be 1.6 per cent, 1.56 per cent and 1.57 per cent. K. Kuerschner, Zeitschrift fuer angewandte Chemie, volume 42, pages 593ff.

Variation in the Lignin Content of Pine Wood

THE residue obtained after treatment of wood with 66 per cent sulphuric acid or with concentrated hydrochloric acid at zero degrees C. is lignin. The average amount of lignin in pinewood is 27 to 28 per cent. Lignin consists of a condensed form of conferiyl aldehyde, whose acrolein complex is the reason why sulphur dioxide has a solvent action on lignin. Methoxyl is responsible for the formation of methanol in dry distillation of wood and for the evil-

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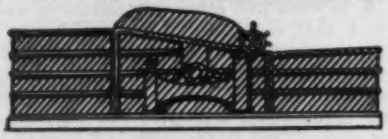

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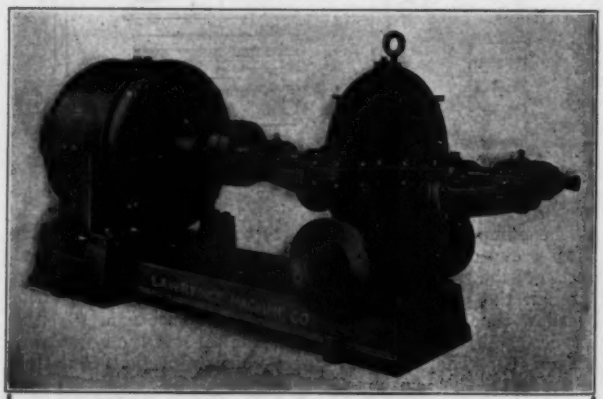

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smelling mercaptans in the sulphate process. The author uses these facts to formulate a picture of the formation of lignin in wood. This is discussed in detail.

The sulphuric acid method for the determination of lignin is described in detail and studied. Certain improvements are suggested. The influence of different climatic conditions on the lignin content in pinewood is also studied. It was determined that the climatic conditions cannot cause a variation in the lignin content of wood of plus or minus one per cent as a maximum. P. Klason, Svensk Papp. Tidn., volume 32, pages 494ff.

Regulating Feed to Papermaking Machines

FIGURE 1 shows the wet end of a papermaking machine with the regulating mechanism. The stuff chest is shown at (2), the pulp being led to the table (3) and the wet web being carried off by the felt (1). A tank (5) is used to

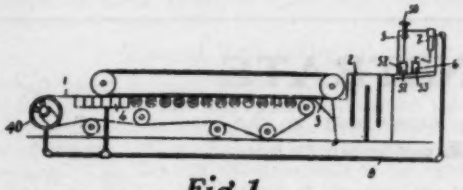


Fig 1

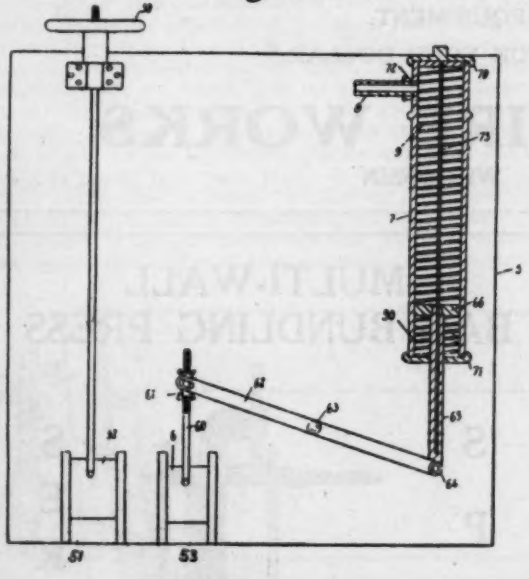


Fig 2

feed pulp to the stuff chest (2). The tank has two openings: (51) and (53) controlled by the slide valves (52) and (6) which regulate the flow of pulp into the box (2). One of the openings (51) is provided with a door (52) which is raised and lowered by means of the hand-wheel (50). The other opening (53) carries a door (6) which is actuated by means of a pressure valve mechanism enclosed within the cylinder (7), which is connected by means of the pipe (8) with the suction boxes (4) or the cylinder 40.

The pressure valve mechanism shown here is of the type which consists of a cylinder (7), bored to hold a piston (66) which is mounted on a tube (65) which passes through the center of the cover (71). A guide rod (73), which is made fast to the upper cover (70) runs down through the piston (66) and into the tube (65). A long helical spring (9) in the interior of the cylinder (7) above the piston (66) and a short helican spring (90) under the piston (66) maintains the latter in a state of equilibrium in its normal position.

The inlet (72) at the upper end of the cylinder (7) is connected with a vacuum line (8) connecting either with the suction boxes (4) or the cylinder (40), in such a manner that the vacuum effect at the upper end of the cylinder (7) above the piston (66) is always equal to that in the suction boxes (4) or the cylinder (40). A lever (62) pivoted at the fulcrum (63) is articulated at the lower extremity (64) with the tube (65), and it is connected at its other extremity with the regulatable swivel joint (61) mounted on a rod (60) which is fixed to the drop slide (6) which it thus controls.

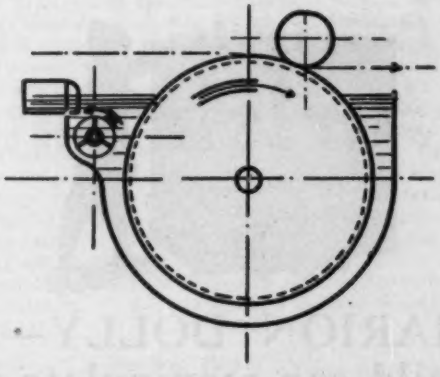
The operation of the apparatus is as follows: The regulated slide (6) is set in place by means of the swivel joint (61), in such a manner so as to permit a certain normal flow into the box and the amount of the flow is thus controlled so that it is sufficient to give a paper of the desired weight and density. If the paper web, which passes over the suction box becomes thinner or lighter than is desired, the vacuum which prevails in the suction box will be reduced and this diminution will be immediately transmitted to the part of the cylinder located above the piston.

The long spring normally maintains the piston against the action of vacuum in this part of the cylinder, but when the vacuum in this part of the cylinder is reduced, the spring exercises a greater pressure on the piston, and due to this fact it forces the piston to descend. The movement of the descending piston raises the sliding door of the opening (53) and increases the flow of stock to the box and also on to the wire, thus increasing the weight and the density of the paper. A. Kolitsch, French Patent No. 662,575.

Cardboard Machine with Three Wire Sections

THIS machine is provided with one cylinder wire and two fourdrinier wires. Seven different possibilities of operating the machine are described. These pertain to variations in the manner in which the webs, obtained from the different wires, are combined, etc. Individual details of the machine are described.

One improvement and innovation that deserves attention is shown in the accompanying diagram. An agitating device



is shown at the inlet of the stuff chest. This agitator is operated by means of a chain drive in the direction of the flow of the stock. The speed of this device is regulated according to the speed of the stock with the result that uniform distribution of the stock is obtained. The web that is made by the cylinder wire shown is also uniform in density and weight. Zellstoff und Papier, volume 9, pages 831-4.

Errors in Sulphite Digestion

ERRORS occasioned by the use of superheated steam are discussed. These errors are incurred in a Ritter-Kellner digester without built-in steam temperature regulators or steam heating coolers. The literature warns against the use of temperatures in excess of 220 degrees C. When the temperature increases above this point, the stock is burnt and this results in a pulp which contains many impurities. These are caused by too energetic evaporation of the liquor. The level of the liquor in the digester sinks to such a point that the wood is exposed to the action of the mixture of super-

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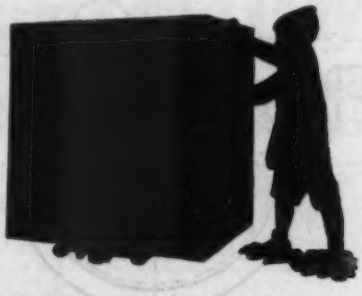

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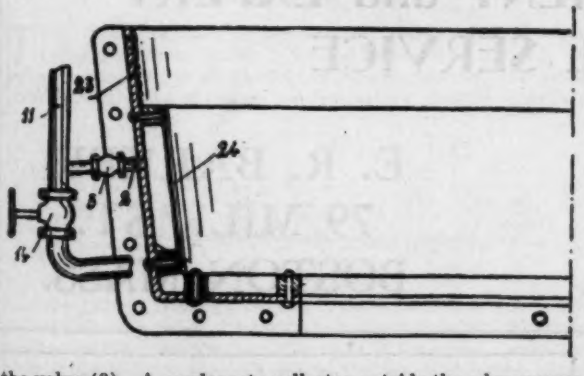
heated steam and gas. The stock dries out first, then becomes brown and is burned. The amount of burnt stock may be as much as two to three cubic meters but appears to be more as it is distributed through the mass in the digester. It is very difficult to separate the burnt stock from the rest of the pulp.

The fact that the hot heating coils may also cause carbonization of the white stock in the digester follows from this discussion. It has been found that after the pressure on the digester has been released and the liquor has been removed, the flow of cooling water into the digester does not at times penetrate the mass of stock quickly enough so that the white pulp nearest to the coils is carbonized. The general conclusion is that the use of superheated steam for indirect digestion of pulp introduces certain disadvantageous conditions which more than counterbalance any benefit that might be derived from such practice. This is due principally to the poor distribution of the heat. The experience of the investigator has shown that such heating increases the time of digestion by about twenty-five per cent. Zelltsoff und Papier, volume 9, pages 830-1.

Heated Kollergang

THE kollergang or edge runner mill is provided with a double wall. This wall may extend throughout the entire apparatus or it may be limited to certain parts. Steam is introduced into the hollow space between the walls for heating purposes. The bowl of the apparatus is provided with external heat insulation. The bowl of the machine is filled with the stock in the usual manner and then warm water, containing soda, is added, until the stock has attained the desired temperature. Due to the fact that the inner walls of the apparatus are heated by the steam, this temperature is maintained, with the result that the stock quickly becomes soft, is very rapidly disintegrated into fibers without the latter being injured in any manner. The stock that is obtained in this manner is free from lumps and knots and can quickly be beaten into whole stuff. It has also been found that the consumption of power in operating the heated edge runner mill is less than in operating a cold apparatus.

The steam is introduced through the pipe (2) into the hollow space and the flow of steam is regulated by means of

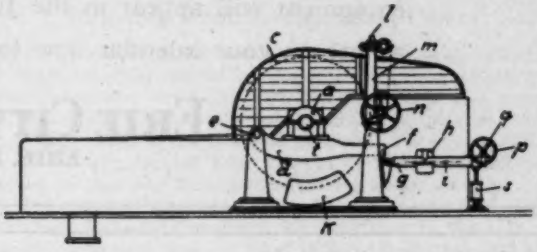


the valve (3). A condensate collector outside the edge runner mill carries off the condensed water. The pipe (11) leads the water to a warm water container, so that warm water or steam can be conducted according to need into the hollow space (24). The water, which is then made alkaline with soda, can be drawn from the aforementioned container directly into the kollergang. V. Antoine. French Patent No. 664,098.

Adjusting Pressure of Beating in Beater

THE illustration shows a new device for adjusting the pressure of the beater roll on the stock passing between the knives of the roll and the knives in the bedplate. Each of the two bearings (a) and (b) of the beater roll (c) is carried on a lever (d), which is rotatable around the pivot (e) and whose free end rests upon the knife edge (f) of a double armed lever (g) provided with adjustable weights as shown. The movable weight (h) runs along a scale (i), which is divided in a given case in such a manner that it gives directly the beating pressure, which exists between the beater roll (c) and the bedplate (k). Thus, the operator of the beater is always able to adjust the pressure exerted in the beater to any desirable point.

The beater roll may be completely raised for purposes of repair and the like with the help of the spindles (1) which is arranged within the vertical stand (m) and which can be



operated by means of a hand wheel (n), which is common to both spindles, one on either side of the beater roll so that they are operated simultaneously by this wheel. The two movable weights (n), which vary in mass according to the different bearing pressures, can be moved by means of a threaded screw, which is a part of the scale (i). The two weights, located on either side of the beater roll, may be moved simultaneously by means of the hand wheel (p) which is connected to a common shaft (q). The result is that both weights are moved the same distance at the same time. The sudden rise of the beater roll caused by the entrance of a hard piece of wood between the knives of the roll and those of the bedplate is taken care of by means of a suitable brake device (s), which may be made in the form of an oil brake or the like. This has the effect of absorbing the shock. H. Mallickh, Dueren, Germany. German Patent No. 483,994.

Sulphite Waste Liquor for Preparing Sulphate Pulp

SULPHUR waste liquor is treated with sodium sulphate. The precipitated calcium sulphate is filtered off and the filtrate is then evaporated to dryness. A causticized solution of the ignited residue contains 40.4 grams of sodium hydroxide, 10.6 grams of sodium carbonate and 12.1 grams of sodium sulphide per liter. Pine wood chips heated with this solution for five and one-half hours at a pressure of 8.5 atmospheres maximum gave a forty per cent yield of a typical sulphate cellulose which contained extract 1.08 per cent, lignin 5.3 per cent and pentosan 5.84 per cent. In order to investigate the chemical reactions which occur, the sulphite waste liquor containing calcium was submitted to dry distillation, when methyl mercaptan, methyl disulphide, a substance (melting point 40 degrees C.) containing sulphur and a well-defined crystalline substance of melting point 119 to 120 degrees C. were obtained. O. Routala and S. Weckman, Suomen Kem., volume 2,147.

Beating Paper Pulp

THE effect of beating stuff in the ball mill has been investigated from the point of view of wetness. Apparatus is described with which the degree of wetness may be measured. The apparent wetness, W, may be divided into two parts, namely the true degree of beating, W_m, and the wetness, W_a, due to water of hydration or imbibition, which is readily removed by boiling. The latter has no effect on the beating action. The relation between W_m and the time of beating or number of revolutions of the mill (x) is expressed by straight lines when $W_m - k$ (where k is a constant of the apparatus) is plotted against (x) on semilogarithmic paper. From such straight lines the equation, $W^1 = W^1_o e^{ax}$, is deduced, where $W^1 = W_m - k$. W^1_o is the initial degree of heating obtained from the graph, and a is the slope of the straight line. The agreement between observed and calculated values of W^1 is good, but observed values at the beginning of beating do not agree with the computed values. Also the formula ceases to hold when the stuff is so far beaten that paper made from it begins to parchmentize. Over a

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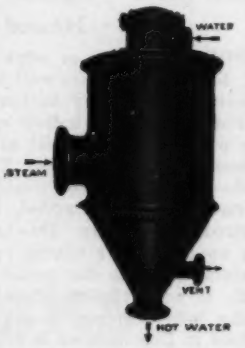

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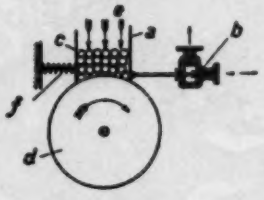
certain range, however, the true corrected degree of beating increases with time according to the compound interest law. M. Nakano, Journal of the Cellulose Institute, Tokyo, volume 5, pages 317-326.

Load Regulation in Magazine Grinders

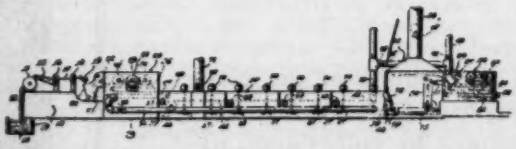
THE movement of the magazine which takes place during ing the grinding process is used for the purpose of actuating a regulating device. This may be, for example, the throttle valve of an oil pressure motor or the electrical regulator of an electric motor. The latter may be used for the purpose of moving the wood in the magazines. In any case, the regulation is directly connected with the circumferential energy of the grindstone. The pressure of the wood against the stone at a certain fixed diameter of the latter is accordingly regulated in conjunction with the existing turning movement, which means in connection with the load on the stone when the speed of rotation is constant.



The apparatus used for this purpose is shown in the accompanying illustration. It is shown there in simplest form. The spindle of the regulating valve is connected with the magazine (a) of a magazine grinder. The movement of the magazine is figured to be only a few millimeters. This regulating valve controls the opening, through which flows pressure oil of the hydraulic motor, that pushes the wood against the grinder. The wood that is being ground is shown at (c) and this wood is pushed against the surface of the grindstone by means of a suitable chain and clamp device. The wood is accordingly constantly moved in the direction of the arrows against the grindstone (d). A strong spring (f) furnishes the counter-force against which the piston of the motor (b) acts. This counter-force maintains the magazine (a) in a normal position. A. G. Brown, Boveri & Cie. German Patent No. 483,993, filed Jan. 31, 1925.

Drying Wood Pulp

THE wood pulp drying apparatus consists of a primary heating chamber which is heated in suitable manner. A suitable conveyer is also provided for transporting the wood pulp through the chamber. A secondary heating chamber



is also a part of the apparatus and this is furnished with independent heating zones through which air is directed. Heating means are provided for the air in each of the zones, including heat interchangers through which the air is directed after passing through the pulp. Thus the temperature of the air is initially raised. Means are provided for directing the exhaust from the primary heating chamber through the heat interchangers for heating the latter. R. D. Kehoe, New York, N. Y. United States Patent No. 1,751,552, filed Feb. 15, 1928.

Drying Coated Paper

THE drying of coated paper is discussed both from the theoretical and the practical standpoints. Various phases of the drying process have been studied, such as the relation between drying and the colloidal properties of the coating, the hygroscopicity and particle size of the pulp, the dye, size and filling, the melting point of the binding agents used and the velocity of the current of air that is used to accomplish drying. A method is described for calculating the time required in drying, the amount of water that is to be evaporated, etc. from the usual works data and the specific heats of the ingredients of the paper and coating. It is also possible to calculate the time required for drying a given type of coated paper from the heat-change coefficient and the heat balance equation. The former is given by the equation:— $a = 5.3 + 3.6w$, wherein (w) is equal to or less than five meters per second, which is the velocity of the air current; (a) represents the heat-change coefficient. J. B. Meyer, Der Papierfabrikant, volume 28, pages 17-21 and 41-46.

Softening Wood or Like Plant Fibers

THE invention is not concerned with the preparation of chemical pulp but of mechanical pulp from other raw materials besides wood, in which the object is not to remove the incrustating materials but to obtain a product which contains as much of the latter as possible. The raw materials are accordingly treated with gaseous or vapor forming substances, so that any loss of incrustating materials is avoided and the greatest possible yield of stock is obtained. The softening of the intermediary cell substance is the sole object of the process and the wood is accordingly brought into a condition in which it can easily be worked up into paper stock or mechanical wood in the kollergang or fine mill. The incrustating materials are accordingly not lost but are used over again in the cycle. Inasmuch as the wood, etc. is treated with sulphur dioxide or rather steam containing sulphur dioxide and mineral acid at temperature below 100 degrees C. the raw materials are not colored. The original white color of the latter is retained or the stock is thereafter bleached.

For example, a container filled with wood is freed from its air content as far as is possible either by sucking the air out or by replacing the air with steam in the usual manner. Then gaseous sulphurous acid is fed into the digester and the contents of the latter are heated by means of exhaust steam at a temperature of 100 degrees C. over a period of six to ten hours. The gas is then sucked out of the upper part of the container by means of a suitable pump.

Examples are also given of the use of steam containing sulphuric acid or hydrochloride acid, or the acid may be atomized into the digester. The temperature is maintained between 98 and 110 degrees C. in this case and the treatment lasts three to six hours. After this treatment, the pressure within the apparatus is released and then sulphur-dioxide is introduced and the treatment proceeds in the usual manner. L. Enge. German Patent No. 484,805, filed Nov. 2, 1924.

Hydrogen Ion Concentration of Sulphite Waste Liquors

THE latest work carried out by Haegglund on the digestion process is described and mention is made of the influence of the concentration of hydrogen ions on the different reactions that take place during the course of the digestion process. The use of electro-metric methods for determining the pH coefficient of the liquor has been found by the author to be inadvisable according to experimental research and a colorimetric method, using thymol blue, was worked out. The difficulties, which surround the use of the colorimetric method, depend on the color of the digestion liquor itself. In order to get around this difficulty and to reduce the color of the waste liquors, the latter are diluted with a constant volume of water. It is assumed that the change in the pH coefficient, which is brought about by dilution, is always of the same nature. This fact has been substantiated by test. There are two breaks in the curve which is obtained in following through the pH coefficient in the course of the digestion. The first takes place at approximately 100 degrees C. and the second at approximately 135 degrees C. The first break in the curve is caused by the diffusion processes that take place in the liquor, whereby the wood eagerly absorbs sulphurous acid, resulting in the formation of insoluble lignin-sulphonic acid compounds. The second break in the curve should not be assigned, as R. Escourrou and Carpentier concluded, to irregularities in the digestion, but to the formation of sulphuric acid and calcium sulphate. This is according to the views of the author. Fotijew, Bumaschnaja Promischlennost, volume 8, pages 34ff.

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Erie, Pennsylvania

New York, May 1, 1930.

THERE is no denying that the United States is experiencing at least mild business depression, and some reports would indicate that the general business situation is worse than mildly depressed. Certainly it is evident that industrial activity is not what it should be, that the movement of merchandise into consuming and export channels has decreased substantially, that the financial statements of numerous leading manufacturing organizations of the country for the current year thus far have not, in a majority of cases, been favorable, and that the lull in retail and wholesale trade is being prolonged beyond the period which was anticipated at the outset of 1930.

Caution seems to be the foreword in business today. Manufacturers, mill representatives, jobbers and distributors, and consumers all are exercising a pronounced degree of caution in their buying activities. Unemployment is affecting the purchasing power of the country, and even those individuals who are employed and who perhaps are earning just as much today as they were some months ago are pulling their purse strings a bit tighter, and are not disposed to buy necessities and luxuries with the freedom that characterized their policy until fairly recently. Consequently, general business is on the slow side; volume is lacking in the movement of goods, and, obviously enough, this situation is being reflected to a marked degree in the manufacturing industries.

The paper industry of course is feeling the effects of the general trade condition. With numerous branches of business quiet, less paper is being required and therefore less consumed. Demand is further diminished because jobbers, converters and consumers are not so inclined to add to their stocks as in more favorable periods; orders are being confined principally to actually needed supplies, and buyers are holding off until the proverbial last moment before making commitments.

Within the industry itself are circumstances accentuating the poor position of the market. Paper production is in excess of the consuming requirements of the country, and there is great pressure to sell. Some manufacturers apparently refuse to recognize the market situation as it happens to exist and continue to operate their plants on a scale well in excess of what the market warrants. Competition for business is keen, exceedingly keen, and in frequent instances price is a matter of secondary consideration to that of getting orders. In consequence thereof, much paper is being marketed at present at prices showing manufacturers not only no profit but in some cases losses; in fact, the industry in its entirety doubtless is operating today at very scant profit.

Latest issued satistics relative to paper production, etc., show that the industry is marked by waning activity. During February, production of paper of all kinds in the United States amounted to 538,237 net tons, compared with 583,655 tons produced in the preceding month, according to reports from identical mills to the American Paper and Pulp Association, representing a decrease of 8 per cent. Shipments from mills in February aggregated 542,018 tons, against 577,983 tons in January, while stocks at mills at the end of February were 256,654 tons, contrasted with 259,729 tons a month earlier. Production of uncoated book paper in February registered an increase of 11 per cent over the same month last year, newsprint 8 per cent, writing paper 4 per cent, tissue paper 3 per cent, whereas the output of wrapping and bag paper and paper board declined as compared with a year ago.

Production of newsprint in the United States and Canada in March, totaling 320,813 tons, showed a gain over the 301,548 tons produced in the preceding month, according to the News Print Service Bureau. Production in the United States was 113,328 tons in March and shipments from mills 109,686 tons, against 112,394 tons produced and 110,714 tons shipped in February, while Canadian mills made 207,485 tons and shipped out 208,629 tons in March, contrasted with 189,154 produced and 178,691 tons shipped in the preceding month. During March, 23,579 tons of newsprint were manufactured in Newfoundland and 1,642 tons in Mexico, so that the total North American production for the month was 346,034 tons, against 324,294 tons in February. The Canadian mills produced 15,076 tons less in the first three months of this year than in the first quarter of 1929, which was a decrease of 2 per cent. The United States output was 7,725 tons or 2 per cent more than in the first three months of last year, while production in Newfoundland was 8,343 tons or 14 per cent more, and in Mexico 100 tons less, making a total increase of 882 tons or practically the same as in 1929. During March the Canadian newsprint mills operated at 68.4 per cent of rated capacity, United States mills at 80.3 per cent, and Newfoundland mills at 98.5 per cent. Stocks of newsprint at Canadian mills at the end of March were 38,661 tons, and at U. S. mills 24,004 tons, making a combined total of 62,665 tons, which was equivalent to 3.7 days' average production.

Production of paper board in the United States in February reached a total of 220,269 net tons, against 233,314 tons in the preceding month and 228,034 tons in the similar month of 1929, according to the monthly summary of the board industry compiled by the U. S. Department of Commerce. New orders for board received by manufacturers in February called for 217,495 tons, compared with 235,390 tons in January, and unfilled orders held by mills at the end of February were for 71,721 tons, against 76,975 tons a month before. Shipments from mills aggregated 224,176 tons during February, contrasted with 228,854 tons in January, while stocks of board held at producing mills at the end of February amounted to 68,844 tons, against 63,242 tons a month earlier.

As statistics show, newsprint is moving into consuming channels only in approximately the same volume as at this time a year ago, the increase of the last several years no longer being maintained. Canadian newsprint manufacturers have suggested to American newspaper publishers that the contract price of standard newsprint be increased $5 per ton, the advance to be spread over the next three calendar years —$2 rise per ton in 1931, $2 in 1932, and $1 in 1933. This increase is declared to be an economic necessity. Evidently this means that no attempt will be made by newsprint producers to raise the price of their product during the current year.

Wrapping paper is in little more than routine demand, and while no further drop in prices has been registered, the market tone is easy. Tissue is in limited demand, and on the soft side quotably. Competition among manufacturers in fine paper is very keen, especially in the low-priced lines, and the price situation is none too steady. Book paper is enjoying a fairly good movement against contracts but fresh demand is restricted. Box boards are in steady but limited call, with no important change in quoted prices. Building papers are in far less than usual demand and mills making these grades are reported to be running only at around 50 per cent of capacity in some cases.

James d'A Clark, formerly of Bowater's Paper Mills, Ltd., Gravesend, England, who is widely known as a paper mill engineer and the inventor of an apparatus for measuring the contract ratio of opaque and translucent papers, has taken up his residence in the United States. He was married on Sunday, April 27, to Miss Agnes Losee, of Red Hook, N. Y., daughter of Dr. Edwin Knickerbocker Losee, of that village.

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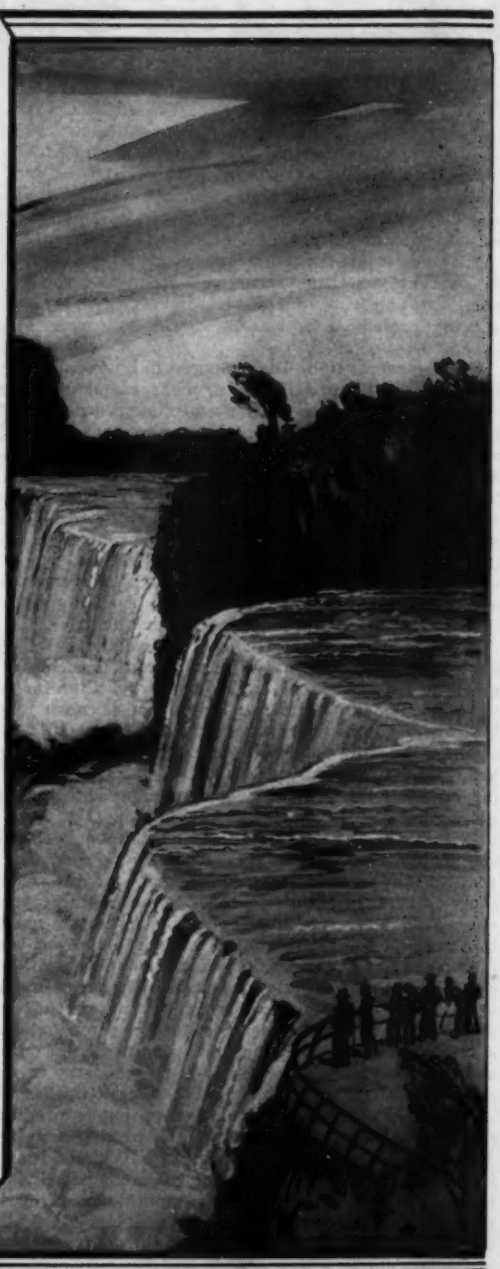

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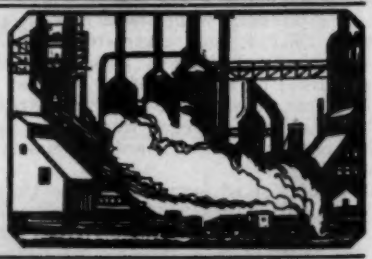

Papermaking Rags

Reflecting the rather general slowness in the paper manufacturing industry, demand for rag stock currently is along noticeably restricted lines. Paper mills are absorbing supplies of some grades of rags fairly freely when urgent requirements need to be covered, but there is at best spotty activity in the market. Some descriptions of rags are characterized by a rather firm price tone, yet such instances are found, upon investigation, to be due more to conditions affecting supplies than to the volume of demand emanating from consuming quarters. In short, the market for papermaking rags is quiet, with some grades difficult indeed to sell, and with the aggregate amount of stock moving toward mills substantially under what might well be called normal.

Rags for papermaking are cheap today; that is, prevailing market prices are in a majority of cases lower than have been witnessed in a long time. The present level of prices has been brought about by very reserved buying on the part of mills for some while past, and the consequent failure of demand to take up the slack of supply of most classes of rags used by paper manufacturers. It can even be stated that certain sorts of rags are being pressed upon mills, on account of the eagerness of dealers and importers to effect sales, and recent recessions in market rates have brought prices down to where purchases would appear to be attractive, yet mills are not buying unless in need of supplies.

On the other hand, there are flashes of firmness in the market here and there. Some kinds of rags are held in relatively small quantities, and are not being produced in normal volume, with the result dealers are exercising care in entering selling commitments. The market, in fact, is possessed of a certain degree of potential strength. Collections of rags the country over are far below par, as many collectors have forsaken the rag industry in search of more lucrative forms of livelihood; imports have decreased, owing to the narrow consuming market outlet in this country recently, and production of new cuttings is well short of normal, because of the situation in the clothing manufacturing industry and the curtailment of operations of wearing apparel establishments.

Thus, while the market has a dubious complexion and a weak undertone with demand from paper mills as slow as it now happens to be, a return to more normal conditions for the papermaking industry and an increase in consumption of rags by paper mills doubtless would quickly change the aspect of the rag position. In fact, dealers contend that even a little broadening of demand for some classes of rags would cause market prices to rise promptly and fairly sharply.

A further decline has occurred in prices of roofing rags, and reports tell of mills engaging in little or no buying of these grades temporarily. Domestic No. 1 roofing or cloth strippings are down to 1.65 cents a pound f.o.b. dealers' shipping points, and No. 2 domestic to 1.10 cents, while foreign dark colored cottons are reported offered at 1.20 cents a pound ex-dock American Atlantic ports. Old white cottons are relatively steady in price, with little quotable change noted, and with demand on a fair scale. Thirds and blues also are favored with moderate demand, and repacked blues are reported bringing 2.50 to 2.75 cents a pound f.o.b. shipping points, and rough blues around 1.90 cents.

Most grades of new cuttings have eased a bit more in value. New No. 1 white shirt cuttings are reported available at around 8.50 cents a pound at dealers' shipping points, fancy shirt cuttings at 5.50 to 5.75 cents, light silesias at 7 to 7.25 cents, blue overall cuttings at 7 to 7.25 cents, No. 1 washables at 4.50 to 4.75 cents, and unbleached muslins at 10 to 10.25 cents.

Imported grades are meeting limited demand but not much change in quoted rates is noted, importers reporting that prices at primary sources abroad are being fairly well maintained.

Average quotations f.o.b. shipping points and ex-dock New York are as follows:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	8.25– 8.75
White shirt cuttings, No. 2	6.50– 7.00
Fancy shirt cuttings	5.50– 5.75
Washables, No. 1	4.50– 4.75
Unbleached muslins	10.00–10.50
White lawns	8.00– 8.50
Overall cuttings, blue	7.00– 7.25
Black silesias	4.75– 5.00
Canton flannels, bleached	9.00– 9.50
Canton flannels, unbleached	7.75– 8.00
Shoe cuttings, bleached	7.50– 7.75
Shoe cuttings, unbleached	6.50– 6.75
Light silesias	7.00– 7.25
O. D. khaki cuttings	5.75– 6.00
Mixed khaki cuttings	4.75– 5.00
Corduroy cuttings	3.25– 3.50
Cottonade cuttings	3.00– 3.25
Linens, No. 1 white, foreign	14.00–15.00
Light prints, foreign	4.00– 4.50
Old stock—	
Whites, No. 1, repacked	5.50– 6.50
Whites, No. 2, repacked	2.75– 3.00
Whites, house soiled	2.00– 2.25
Whites, street soiled	1.75– 2.00
Thirds and blues, rough	1.75– 2.00
Thirds and blues, repacked	2.50– 2.75
Lace curtains	4.75– 5.00
Black stockings	4.10– 4.25
Cotton canvas, No. 1	4.25– 4.50
White cotton batting	2.50– 2.75
Roofing, No. 1 (cloth strippings)	1.60– 1.70
Roofing, No. 2	1.10– 1.20
Linsey garments, foreign	1.60– 1.70
Dark colored cottons, foreign	1.20– 1.30
Blue linens, foreign	4.00– 4.50
Gray linens, foreign	4.50– 5.00
White linens, foreign	8.00– 9.00
Light prints, extra, foreign	2.50– 2.75

Rope and Bagging

Paper manufacturers mostly report that they are amply supplied with old rope, and are engaging in limited buying of this raw material. Prices are tending to ease, although no definite changes in market quotational levels have occurred. The probabilities are, however, consumers are succeeding in getting some supplies at additional slight concessions. Domestic No. 1 old manila rope is quoted at 4.25 cents a pound f.o.b dealers' shipping points, and foreign old manila is fetching only about 4 cents or less per pound ex-dock New York or other American Atlantic ports. Strings are in slow call also, and are selling to paper mills at about 90 cents to slightly higher per hundred pounds at shipping points.

Old bagging is comparatively steady in price, more particularly No. 1 bagging and gunny bagging. No. 1 scrap burlap is bringing 1.60 cents a pound at dealers' points in sales to paper mills, and gunny bagging is steady at 1.55 to 1.70 cents per pound. Roofing bagging is something of a drug on the market and is reported available at a cent per pound at shipping points.

F.o.b. shipping point and ex-dock New York quotations follow:

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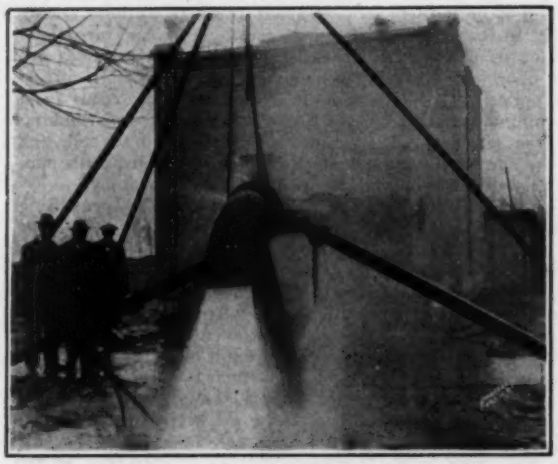

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	New York and Chicago
Gunny, No. 1 domestic	1.60– 1.70
Gunny, No. 1 foreign	1.55– 1.55
Scrap bagging, No. 1	1.55– 1.65
Roofing bagging	1.00– 1.10
Wool tares, heavy	1.65– 1.75
Wool tares, light	1.55– 1.65
Manila rope, No. 1 foreign	3.90– 4.15
Manila rope, No. 1 domestic	4.00– 4.25
Sisal strings	1.75– 2.00
Mixed strings	.90– 1.00

Old Paper

The waste paper market remains in a demoralized condition, insofar as the low quality grades are concerned. High grades are moving fairly well and at prices which are moderately steady, but the so-called board-making descriptions are moving in limited tonnage, consumers are manifesting surprisingly little interest, and prices are in such a position that buyers are operating in the market at almost any figures so long as they make bids within reason. Not only is the eastern market for low grades weak and dull, but prices in the Middle West have moved into lower ground than has been known in a lengthy time. Old No. 1 mixed paper is selling at as cheap as $3 per ton or 15 cents per hundred pounds f.o.b. shipping points, and folded news down to 35 cents per hundred, although dealers in a majority of localities ask slightly in excess of these prices.

Soft white shavings are moving relatively well, and are maintained in price on a range of 2.50 to 2.90 cents a pound at dealers' points of shipment, while hard white shavings are quoted from 2.60 to 3 cents for No. 1 grade, depending on the packing, and No. 1 heavy book stock is bringing about 1.20 cents a pound. Old kraft paper has receded in price to about 1.40 cents per pound, and ledger stock is in slow demand and easy quotably.

The following are quotations named by dealers f.o.b. shipping points, some of which are strictly nominal:

	New York and Chicago
Hard white shavings, No. 1	2.60– 3.00
Hard white shavings, No. 2	2.40– 2.60
Soft white shavings	2.50– 2.90
Colored shavings	.80– .90
Heavy book, No. 1	1.15– 1.25
Crumpled book, No. 1	.90– .95
Ledger stock	.90– 1.40
Kraft No. 1	1.40– 1.60
New kraft cuttings	2.00– 2.15
White blank news	1.70– 1.80
Manilas, No. 1	.55– .65
Manilas, container	.30– .35
Folded news	.35– .55
Sulphite mill wrappings	.50– .60
Old corrugated box cuttings	.40– .50
New corrugated box cuttings	.60– .70
Mixed paper, No. 1	.15– .40
Common paper	(Nominal)

Pulpwood

The contract movement of pulpwood is steady and of fairly broad dimensions, but there is little current activity in the market. Quoted prices are on about stationary levels, with no definite trend in view.

Exports of pulpwood from Canada in March, 1930, amounted to 133,627 cords, valued at $1,208,001, all of which came to the United States, compared with 138,273 cords of a value of $1,265,010 exported in the preceding month.

Mechanical Pulp

While current demand for mechanical pulp is slow, and there is little important activity in the market, quoted prices are maintained and are marked by a fairly firm undertone. This is because producers have limited unsold stocks on hand and therefore are not pressed to make sales, it is said. In fact, the statistical position of the commodity is declared to be rather strong, and this is reflected in ruling market prices notwithstanding the quietness obtaining.

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Kraft	up to	100 Tons
Sulphite	up to	80 Tons
Soda	up to	60 Tons
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With 1 Press	42% A.D.
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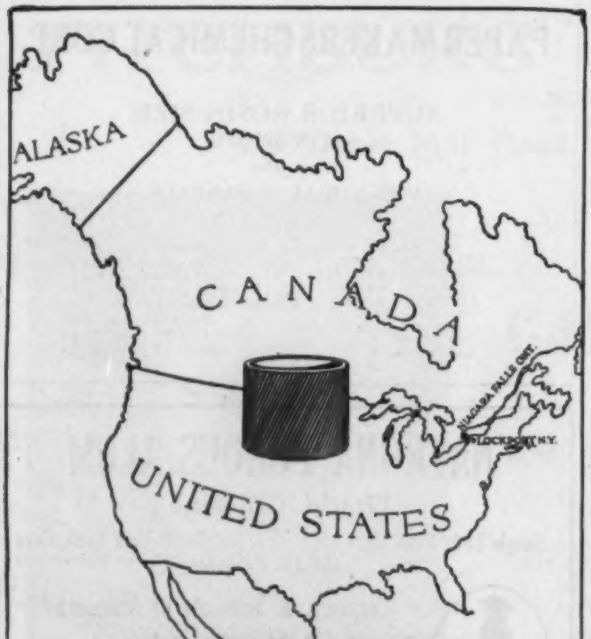

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around $27 per ton f.o.b pulp mills, the full quotational range being from about $25 up to $29 a ton, depending on the air dry test and the haul to consuming centers. Very little domestic groundwood is on offer, and prices are in the vicinity of $30 a ton at shipping points. Scandinavian groundwood is quoted steadily at $33 per short ton for dry and $31 for moist pulp, ex-dock American Atlantic ports.

Production of mechanical pulp in the United States in February amounted to 88,984 net tons, according to identical mills reporting to the American Paper and Pulp Association, compared with 92,701 tons produced in January. Mill stocks at the end of February aggregated 46,290 tons, against 42,709 tons a month before.

Chemical Pulp

Dullness in the chemical wood pulp market is leading to some recession in prices. Consumers not only appear in most cases to be getting along with contract commitments in a manner precluding the necessity of them engaging in additional purchases for current shipment, but in some instances are requesting that deliveries be held up until they are more in need of supplies. Open-market activity is said to be on a very narrow scale. Some spot purchases are of course being effected, but the market as a whole is quiet indeed, and is largely in favor of buyers. The easing of prices of imported pulps has had its influence on domestic pulps, and is responsible in part for the rather soft undertone prevailing in the domestic market.

Bleached sulphite is reported available at 3.25 cents a pound, and perhaps at slightly lower prices in some cases, while extra qualities are still quoted up around 4 cents and even as high as 4.50 and 4.75 cents f.o.b. pulp mills. Kraft pulp is easy, with No. 1 eastern kraft on a price basis of about 2.50 cents to somewhat higher, whereas southern kraft pulp is said to be available at 2 cents and less. Bleached soda pulp is reported fetching around 3.40 cents a pound delivered paper mills.

During February, mills in the United States reporting to the American Paper and Pulp Association produced a total of 126,105 tons of chemical wood pulp compared with 133,551 tons for identical mills in January, and had stocks on hand at the end of February amounting to 22,080 tons, against 21,494 tons at the end of January.

Quotations f.o.b. pulp mills are as follows:

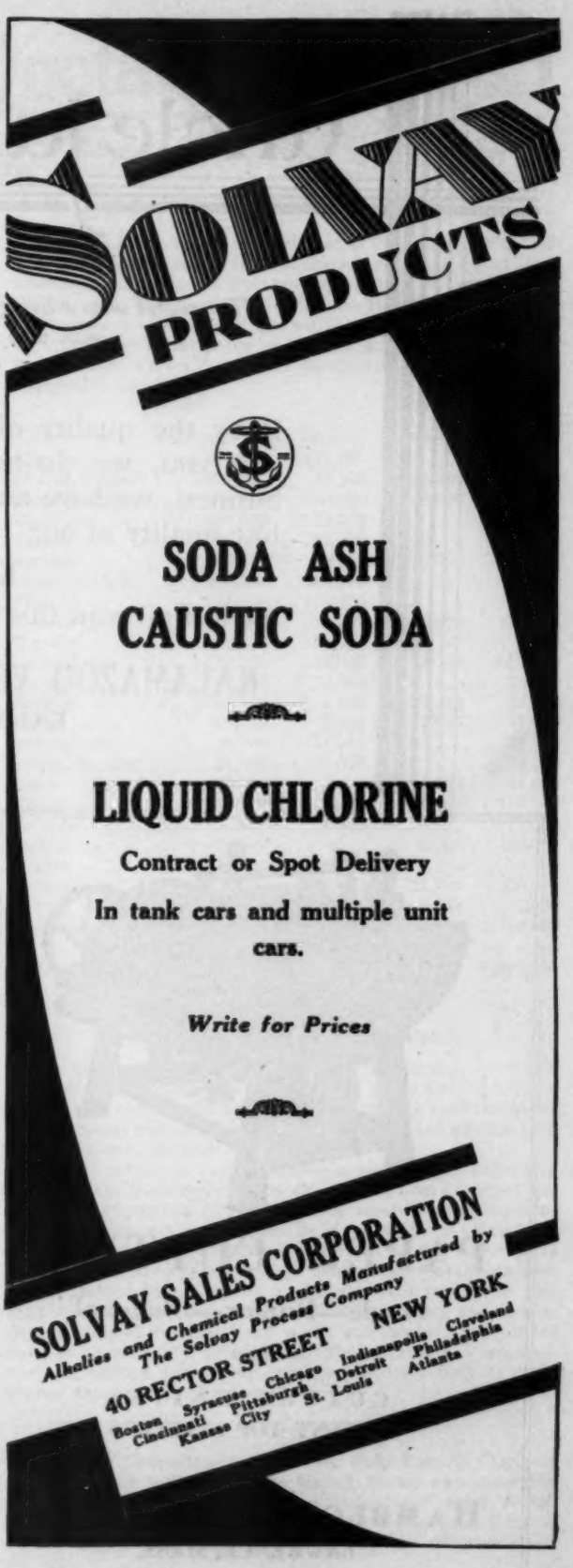
Bleached sulphite	3.25–4.75
Easy bleaching sulphite	2.65–2.90
Unbleached sulphite, No. 1 strong (news grade)	2.40–2.65
Unbleached sulphite, No. 1 book	2.60–2.85
Soda pulp, bleached (delivered)	3.35–3.50
Mitscherlich, unbleached	3.00–3.25
Kraft, No. 1	2.40–2.85
Screenings, refined	1.60–1.85

Chemicals

Papermakers are absorbing chemicals in a regular way on contracts, but are displaying little interest in additional supplies. Current demand is reported quite limited, in fact. Quoted prices are generally maintained. Casein prices range from 13 to 15 cents per pound, with duty paid on the imported product. Soda ash is quoted at 1.32½ cents per pound for the 58 per cent light article, packed in bags. Rosin prices are slightly higher on a basis of 7.65 cents a pound on dock.

Average quotations are as follows:

Alum, lump ammonia	3.50 – 3.75
Alum, lump starch	3.75 – 4.00
Blanc fixe, powdered	3.75 – 4.00
Bleaching powder	2.00 – 2.35
Brimstone (long ton, at mine)	18.00 –20.00
Casein (duty paid)	13.00 –15.00
Caustic soda, spot delivery	3.30 – 3.35
China clay, domestic washed	8.00 –13.00
China clay, foreign	15.00 –21.00
Rosin, Grade E	7.65 –.. ..
Satin white	2.00 – 2.25
Soda ash, 58 per cent light (bags)	1.32½–.. ..
Starch, papermakers', in bags	3.72 –.. ..
Talc (ton)	16.00 –18.00



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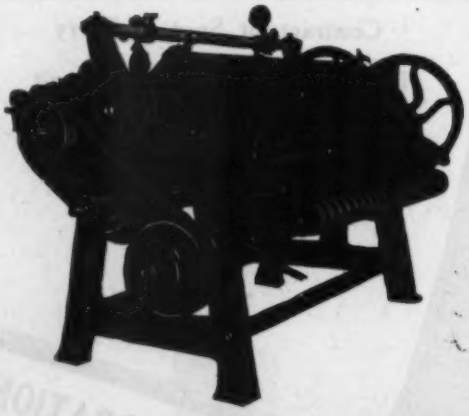

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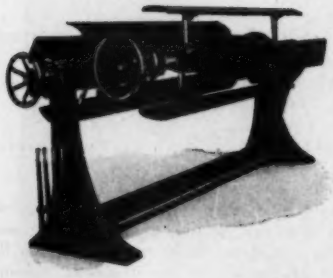

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White sulphite	9–30
Colored rag	15–40
Colored sulphite	8–30
Ledger—	
White rag	16–40
White sulphite	10–30
Colored sulphite	10–30
Colored rag	15–40
Bond—	
White rag	16–40
White sulphite	8–30
Colored sulphite	8–30
Colored rag	15–40
Book—	
No. 1 S. & S. C.	5.75– 8.00
Machine finished	5.50– 8.00
English finish	5.50– 8.00
Coated and enameled	7.50–12.00
Lithograph, M. F.	7.50–12.00
Newsprint—	
Rolls, contract, per ton, delivered New York	62.00-
Rolls, transient, per ton, delivered New York	62.00–
Sheets, per ton, delivered New York	67.00–
Side runs, per ton, delivered New York	47.00–52.00
Cover Stock—	
Coated, both sides	–10.25
Coated, one side	–10.15
Tissue—	
No. 1 white, 20x30	.75– .90
No. 2 white, 24x36	.75– .90
No. 1 Manila, 24x36	.75– .80
Kraft	.95– 1.10
Wrapping—	
No. 1 kraft	6.00– 6.50
No. 2 kraft	3.50– 4.50
Southern kraft	3.00– 4.00
Boards—	**New York and Chicago**
Solid news	40.00–45.00
Straw	50.00–55.00
Plain chip	35.00–37.50
White coated chip	50.00–55.00
Manila coated chip	45.00–50.00
Binder's board	65.00–70.00

Thos. H. Savery, Jr. Resigns from Bird Machine Co.

The Bird Machine Company announces with regret the resignation of Mr. Thomas H. Savery, Jr. as manager of our western territory and Chicago office, a position that he has long faithfully and ably filled.

Mr. Savery has resigned in order to devote himself to the interests of the Nash Engineering Company, whose products he will continue to distribute in pulp and paper mills. This business he will carry on beginning April 15 from his new office in the Board of Trade Building, Jackson and LaSalle Streets, Chicago, Illinois. We shall retain our office at 80 East Jackson Boulevard, to which address please continue to send all mail concerning our business.

Effective April 15, Mr. Franklin F. Frothingham, who has been connected with our Chicago office for the past year, is appointed manager of that office and our western territory.

World Production of Newsprint in 1929

With the co-operation of a number of foreign organizations of paper manufacturers and the assistance of the Paper Division of the Bureau of Foreign and Domestic Commerce in Washington, the News Print Service Bureau has compiled the following estimates of the world production, imports and exports of newsprint paper in 1929. Figures represent 2,000-lb. tons, and with a few minor exceptions are believed to be essentially correct:

Country	Production	Exports	Imports	Balance at Home
Canada	2,729,000	2,511,000	.....	218,000
United States	1,392,000	19,000	2,421,000	3,794,000
Great Britain	636,000	108,000	403,000	931,000
Germany	623,000	172,000	.....	451,000
Japan	286,000	57,000	.....	229,000
Sweden	275,000	216,000	7,000	66,000
Newfoundland	256,000	258,000	.....	2,000
Finland	215,000	191,000	.....	24,000
France	210,000	13,000	214,000	411,000
Norway	189,000	184,000	.....	5,000
Netherlands	77,000	32,000	32,000	77,000
Austria	62,000	32,000	.....	30,000
Belgium	57,000	8,000	23,000	72,000
Italy	52,000	2,000	7,000	57,000
Switzerland	48,000	11,000	.....	37,000
Czechoslovakia	47,000	13,000	.....	34,000
Spain	30,000	.....	14,000	44,000
Russia	30,000	.....	87,000	117,000
Estonia	27,000	18,000	.....	9,000
Poland	23,000	.....	3,000	26,000
Mexico	19,000	.....	.....	19,000
Denmark	11,000	6,000	25,000	30,000
Latvia	4,000	.....	3,000	7,000
Not Specified	10,000	.....	.....	10,000
Total	7,308,000	3,851,000	3,239,000	6,696,000

Hard-sized Paper Held Dutiable

The United States Customs Court has decided adversely to the claims of importers of hard-sized paper for ink writing tablets and against the claim of the importers that the paper was standard newsprint duty free. The customs officials held the paper to be dutiable.

Another series of customs cases abandoned by importers of paper has been reported by the Import Committee of the American Paper Industry. The cases involved four importations of fruit box liner paper, held by customs officials at San Francisco to be dutiable but claimed by the importer to be duty free; five importations of book paper through various ports claimed by importers to be standard newsprint and duty free; thirteen importations of various fancy and special papers claimed by importers to be dutiable at lower rates than as classified by the customs officials; fourteen importations of writing paper and envelopes held for duty at rates higher than claimed by importers.

The Joint Committee on Approved Pulp Testing Chemists for The Paper Industry of the United States announces the admission of Harold E. Tiffany, Wilmington Testing & Research Laboratories, 1002 West Street, Wilmington, Del., as an approved commercial pulp testing chemist, effective April 24, 1930.

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Bleached Sulphite

"FORSHAGA"
Bleached Sulphite

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Extra Strong Kraft

"BAMBLE"
Extra Strong Kraft

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Howard Smith Paper Mills, Montreal, Quebec.
EASTERN AGENTS of Sulphite Pulp
Made by Port Huron Sulphite & Paper Co., Port Huron, Mich.

PULP

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PAPER

EXPORTS

There was a fairly sharp decrease in exportations of paper from the United States in February, 1930, as compared with exports in both the preceding month and the similar month last year, according to official statistics compiled and issued by the U. S. Department of Commerce in Washington. Paper exports in February reached a value of $2,617,833, contrasted with shipments of a total value of $3,434,249 in January of this year, and $3,542,884 in February a year ago.

Newsprint exports in February amounted to 2,330,411 pounds, of a declared value of $91,120, compared with 2,939,159 pounds of a value of $104,237 in the preceding month, and 3,542,884 pounds of a value of $125,541 in February last year. Wrapping paper exports showed a slight increase in February, amounting to 3,799,386 pounds of a value of $249,785, against 3,748,493 pounds, valued at $247,386, in the same month last year, while uncoated book paper exports declined from 2,631,804 pounds of a value of $207,985 in February, 1929, to 1,934,912 pounds of a value of $134,873 in the same month this year. Writing paper exports in February were 1,809,593 pounds of a value of $177,093, contrasted with 2,480,668 pounds of a value of $273,500 in the similar month of 1929. Export shipments of boxboard reached a value of $106,244 last February, against $134,038 a year ago, while building and sheathing paper to the value of $60,866 was exported in February, compared with shipments valued at $77,325 in February, 1929.

Total exports of paper of all kinds from the United States in the first two months of the current year were valued at $6,052,082, showing a decline from shipments of a value of $6,719,227 in the same period last year.

IMPORTS

Wood Pulp

Several salient factors are combining to make for a quiet and weak market for imported wood pulp. Chief of these factors is that paper and board manufacturers in the United States are engaging in very limited buying of foreign pulp at present. Not only are they exhibiting a pronounced lack of desire for additional supplies, but in some instances consumers themselves are striving to resell surplus lots of imported pulp to whoever is interested or wherever they can locate a buyer. Slowing down of paper business has put some papermakers in the position of having more pulp on hand or in view than they require or care to carry, and record-breaking importations thus far this year have piled up stocks in this country to a point where it can well be said that the market is in a very unhealthy and unsatisfactory condition.

Prices have receded rather sharply on some classes of foreign chemical pulp. Kraft and bleached sulphite in particular are on the easy side, and sales of prime Scandinavian kraft pulp have been reported down to 2 cents a pound ex dock New York and other American Atlantic ports, with the possibility that buyers have succeeded in getting some kraft even below this figure. Bleached sulphite of prime quality is offered at 3.20 and 3.25 cents per pound ex dock New York, and there have been rumors of transactions in such pulp at well under these prices. Strong prime unbleached sulphite is on a quotable basis of around 2.65 cents per pound ex dock American Atlantic ports, and is showing perhaps better price stability than any other grade of imported pulp. Prime easy bleaching is reported available at 2.75 to 2.80 cents ex dock, and ordinary Mitscherlich unbleached sulphite at 2.50 cents. Scandinavian groundwood is quoted at $33 per short ton ex dock Atlantic seaboard for dry pulp.

Imports of wood pulp into the United States in February continued heavy, and the total importations in the first two months of this year probably set a new high record of pulp movement from European sources to the U. S. for that period of time. February receipts of chemical pulp, according to official statistics issued by the U. S. Department of Commerce, amounted to 159,645 long tons, of a declared value of $8,811,936, compared with 153,092 tons of a value of $8,570,986 imported in the first month of the current year. Thus, the two months' imports reached a total of 312,737 long tons, registering an increase of no less than 72,000 tons over the 240,613 tons imported during the corresponding period last year. Should the big average of monthly imports established in the first two months of the year be maintained even in part over the remainder of 1930, there is no question that a new high record of pulp imports will be reached this year, despite the fact that a new record was established last year.

Imports of groundwood in February amounted to 34,915 long tons, valued at $966,169, making a total of 60,293 tons for the first two months of this year, valued at $1,704,919, contrasted with 35,768 tons of a declared value of $934,827 imported in the similar time of 1929.

Current market quotations ex dock New York, and receipts at the port of New York during April, 1930, follow:

Bleached sulphite, No. 1	3.15– 4.25
Unbleached sulphite, strong No. 1	2.60– 2.75
Unbleached sulphite, No. 2	2.40– 2.60
Easy bleaching sulphite	2.75– 3.00
Mitscherlich unbleached, genuine	2.85– 3.00
Mitscherlich unbleached, ordinary	2.50– 2.65
Kraft, standard Swedish	2.00– 2.20
Groundwood, per ton (dry)	33.00–34.00

M. Gottesman & Co., 1,800 bls. from Stockholm, 5,840 Sibenik, 1,000 Hamburg and 1,500 Rotterdam; A. P. W. Paper Co., 15,155 bls. groundwood from Sheet Harbor, N. S.; Price & Pierce, Ltd., 500 bls. from Gothenburg; Parsons & Whittemore, 297 bls. from Gothenburg; Guaranty Trust Co., 229 bls. from Gothenburg; Lagerloef Trading Co., 2,633 bls. from Kotka, 1,060 Tolkis and 640 Raumo; J. Anderson & Co., 2,000 bls. from Drammen, 2,960 Greaker and 380 Hamburg; Castle & Overton, 3,700 bls. from Hamburg and 160 Rotterdam; Bulkley, Dunton & Co., 2,750 bls. from Gefle; Johaneson, Wales & Sparre, 609 bls. from Gothenburg; E. M. Sergeant Co., 948 bls. from Gothenburg; Irving Trust Co., 125 bls. from Oslo; Pagel, Horton & Co., 500 bls. from Gefle; National City Bank, 286 bls. from Hamburg; Atterbury Bros., 500 bls. from Oslo; Order, 640 bls. from Kotka and 650 Hamburg.

Paper Stock

Imports of rags for papermaking into the United States during February amounted to 26,630,269 pounds, making a total for the first two months of this year of 65,487,335 pounds of a value of $1,295,226, compared with 66,455,140 pounds of a declared value of $1,254,575 imported in the corresponding period last year, according to official Department of Commerce statistics. Imports of waste bagging and waste paper in the first two months of this year were 19,653,966 pounds, against 22,607,741 pounds in the similar time a year ago, while imports of old rope and miscellaneous paper stock amounted to 18,254,686 pounds, contrasted with 11,007,318 pounds last year in the same time.

Importations of papermaking material in April were moderate only, judging from receipts through the port of New York. Imports of all kinds of paper stock excepting wood pulp at New York last month, these data being taken from

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Unbleached Sulphite 50 tons daily
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Our pulp is made from Canadian Spruce
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manifests of steamers reaching that port during the month, were as follows:

Old Rope—Brown Bros. & Co., 304 bls. and 745 coils; International Germanic Trust Co., 50 bls. and 44 coils; William Steck & Co., 214 coils and 63 bls.; Anglo-South American Trust Co., 82 coils; R. M. Gray, Inc., 23 coils; International Purchasing Co., 274 coils and 34 bls.; United Fruit Co., 2 bls.; American Express Co., 391 coils; Order, 85 coils and 55 bls.

Old Bagging—Darmstadt, Scott & Courtney, 362 bls.; Brown Bros. & Co., 118 bls.; International Germanic Trust Co., 244 bls.; Ernst Mayer, 95 bls.; S. Birkenstein & Sons, 169 bls.; Banca Commerciale Italiana Trust Co., 92 bls.; Fidelity Trust Co., 37 bls.; Seidel Herzog, 13 bls.; Van Oppen & Co., 168 bls.; E. Butterworth & Co., 182 bls.; William Steck & Co., 114 bls.; Castle & Overton, 123 bls.; E. J. Keller Co., 69 bls.; Order, 162 bls.

Rags—Castle & Overton, 1,283 bls.; Darmstadt, Scott & Courtney, 370 bls.; E. Butterworth & Co., 120 bls.; Victor Galaup, Inc., 241 bls.; Amtorg Trading Co., 7,606 bls.; Atlas Waste Mfg. Co., 29 bls.; Fritz Stern, 142 bls.; Ernst Mayer, 224 bls.; J. Reiss & Co., 47 bls.; A. C. Loveland & Co., 21 bls.; J. Cohen & Sons, 20 bls.; William Steck & Co., 80 bls.; G. Ford, 30 bls.; Harmon G. Lichtenstein, 225 bls.; Belgam Corp., 28 bls.; Kahn Bros., 23 bls.; P. Garvan, Inc., 142 bls.; American Rag Trading Co., 34 bls.; H. Burrows, 15 bls.; Lamport Mfg. Supply Co., 51 bls.; E. J. Keller Co., 663 bls.; Paul Berlowitz, 50 bls.; Standard Bank of South America, 15 bls.; International Germanic Trust Co., 620 bls.; Dominion Bank, 35 bls.; Manufacturers Trust Co., 93 bls.; Guaranty Trust Co., 380 bls.; National City Bank, 85 bls.; Trust Co. of North America, 37 bls.; Fidelity Trust Co., 456 bls.; Irving Trust Co., 220 bls.; Chase National Bank, 180 bls.; French-American Banking Corp., 35 bls.; New York Trust Co., 78 bls.; Equitable Trust Co., 1,334 bls.; American Union Bank, 63 bls.; Hanover Bank & Trust Co., 63 bls.; Anglo-South American Trust Co., 43 bls.; C. R. Spence & Co., 298 bls.; A. W. Fenton, Inc., 459 bls.; American Express Co., 21 bls.; Pequannock Paper Co., 46 bls.; Van Oppen & Co., 328 bls.; Erie Railroad Co., 13 bls.; Brown Bros. & Co., 43 bls.; Pennsylvania Railroad Co., 167 bls.; Order, 1,863 bls.

Miscellaneous Paper Stock—J. Cohen & Sons, 59 bls.; Baring Bros. & Co., 209 bls.; T. D. Downing & Co., 227 bls.; First National Bank of Boston, 85 bls.; Equitable Trust Co., 452 bls.; International Germanic Trust Co., 35 bls.; Castle & Overton, 498 bls.; R. M. Gray, Inc., 193 bls.; S. Birkenstein & Sons, 144 bls.; Irving Trust Co., 251 bls.; Darmstadt, Scott & Courtney, 87 bls.; Harmon G. Lichtenstein, 68 bls.; Brown Bros. & Co., 155 bls.; Anglo-South American Trust Co., 100 bls.; Order, 285 bls.

Paper

Imports of paper into the United States in February, 1930, reached a total value of $10,367,617, showing a decrease as compared with importations valued at $13,348,768 in the preceding month, and also a decline as contrasted with imports of a value of $11,550,497 in the similar month last year, according to official statistics compiled and issued by the U. S. Department of Commerce in Washington. Imports during the first two months of the current year were valued at $23,717,761, against $25,161,811 in the corresponding period last year.

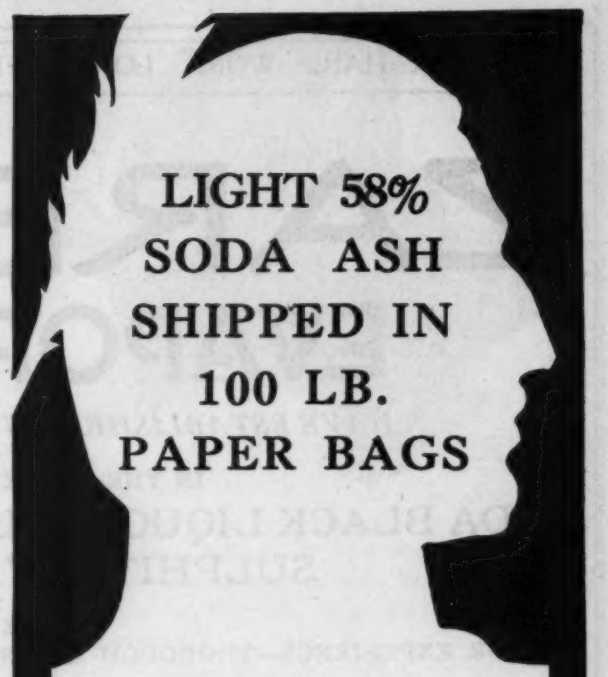
Paper imports in April were of about normal volume, taking the receipts through the port of New York as a criterion. Arrivals of all kinds of paper at that port last month, these data being unofficial and taken from manifests of steamers reaching New York during April were as follows:

Printing—Perkins-Goodwin Company, 1,228 reels from Hamburg and 42 reels Bremen; E. Dietzgen & Co., 80 cs. from Hamburg and 223 cs. Rotterdam; Snow Shipping Co.; 29 cs. from Marseilles; Scripps-Howard Supply Co., 264 reels from Gothenburg; W. H. Bell, 3,968 rolls from Liverpool, N. S.; C. Steiner, 62 cs. from Bremen; Keuffel & Esser Co., 126 rolls and 18 cs. from Hamburg and 3 cs. Rotterdam, F. C. Strype, 36 cs. from Rotterdam; The Times Co., 314 reels from Gothenburg; Lunham & Reeve, 724 reels from Kotka; G. Henschel & Co., 11cs. from Hamburg; Martin & Bechtold, 22 cs. from Bremen; P. C. Zuhlke, 37 cs. from Antwerp; Guaranty Trust Co., 65 bls. from Hamburg; Parsons & Whittemore, 161 rolls from Helsingfors; A. S. Zabriskie, 71 reels from Hamburg; Rectigraph Co., 75 cs. from Havre; Order, 373 rolls from Oslo, 99 reels Hamburg, 1,122 reels Kotka and 895 reels and 129 bls. Bremen.

Wrapping—Borregaard Co., 1,760 reels and 144 bls. from Gothenburg International Acceptance Bank, 22 reels from Oslo; Atlantic Forwarding Co., 4 cs. from Hamburg; Sylvania Industrial Corporation, 67 cs. from Antwerp; Standard Products Corporation, 14 cs. and 45 rolls from Antwerp; C. Steiner, 6 cs. from Hamburg; F. L. Kraemer & Co., 85 bls. from Gothenburg; F. C. Strype, 20 cs. from Antwerp; L. Serra, Inc., 38 bls. from Genoa; Insight Paper Co., 294 reels from Oslo; Robert Wilson Paper Corp., 15 cs. from Glasgow; International Germanic Trust Co., 6 reels from Hamburg; Order, 23 cs. from Rotterdam, 63 cs. Southampton and 17 bls. Glasgow.

Cigarette—American Tobacco Co., 1,200 cs. from Bordeaux; Liggett & Myers Tobacco Co., 28 cs. from Bordeaux, 50 cs. Liverpool and 63 cs. Havre; Suarez & Carspo, 6 cs. from Alicante; H. Strauss, 180 cs. from Havre; P. J. Schweitzer, Inc., 23 cs. from Havre and 148 cs. Marseilles; Standard Products Corp., 800 cs. from Havre and 60 cs. Southampton; British-American Tobacco Co., 7 cs. from Southampton; M. Spiegel & Sons, 8 bls. from Genoa; DeMauduit Paper Corp., 354 cs. from Havre and 589 cs. St. Nazaire; H. H. O'Leary, 2 cs. from Bordeaux; Order, 6 cs. from Trieste and 164 cs. Marseilles.

Writing—Guibont Freres & Co., 6 cs. from Havre and 2 cs. Southampton; Gallagher & Ascher, 2 cs. from London; D. C. Andrews & Co., 4 cs. from Southampton; F. B. Vandergrift & Co., 10 cs. from Hamburg.



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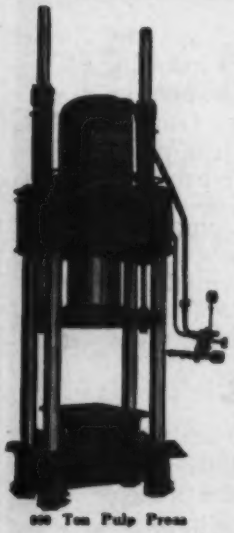

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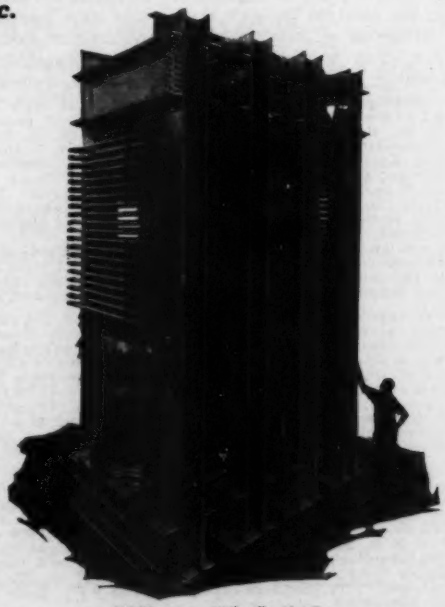

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Tissue—F. C. Strype, 64 cs. from Helsingfors and 27 cs. Genoa; W. J. Byrnes & Co., 21 cs. from Southampton; G. W. Sheldon & Co., 3 cs. from London.

Drawing—H. Reeve Angel & Co., 4 cs. from London; Devoe & Raynolds, 6 cs. from London; Keuffel & Esser Co., 132 cs. from Hamburg; Favor, Ruhl & Co., 5 cs. from London and 21 cs. Havre.

Hanging—F. J. Emmerich & Co., 50 bls. from Hamburg and 7 bls. Liverpool; C. A. Haynes & Co., 35 bls. from Southampton, 170 cs. London and 25 pkges. Liverpool; W. H. S. Lloyd & Co., 8 cs. from London and 8 cs. Havre; Irving Trust Co., 46 cs. from Hamburg; Guaranty Trust Co., 9 cs. from Hamburg; J. E. Bernard & Co., 6 bls. from Liverpool and 24 bls. Antwerp; F. G. Prager & Co., 96 bls. from Antwerp; R. F. Downing & Co., 8 cs. from Southampton, 4 cs. Antwerp and 3 bls. London; F. L. Kraemer & Co., 7 cs. from Southampton; F. A. Binder, 2 bls. from Bremen; Order, 7 bls. from Hamburg.

Photo—Globe Shipping Co., 176 cs. from Bremen; J. H. Schroeder Banking Corp., 51 cs. from Bremen; Tice & Lynch, 4 cs. from Southampton; Gevaert Co. of America, 213 cs. from Antwerp; Medo Photo Supply Co., 3 cs. from Southampton; J. J. Gavin & Co., 3 cs. from Southampton.

Board—Lagerloef Trading Co., 36 reels and 200 bls. from Kotka; American Express Co., 221 cs. from Hamburg; Lowy & Lowy, 26 bls. from Gothenburg; Progressive Fibre Specialty Co., 6 bls. from Gothenburg; Coty, Inc., 41 cs. from Antwerp; Houbigant, Inc., 20 cs. from Antwerp; Chatham & Phenix National Bank, 42 bls. from Gothenburg; Walker Goulard Plehn Co., 192 rolls from Rotterdam; Order, 41 bls. from Hamburg.

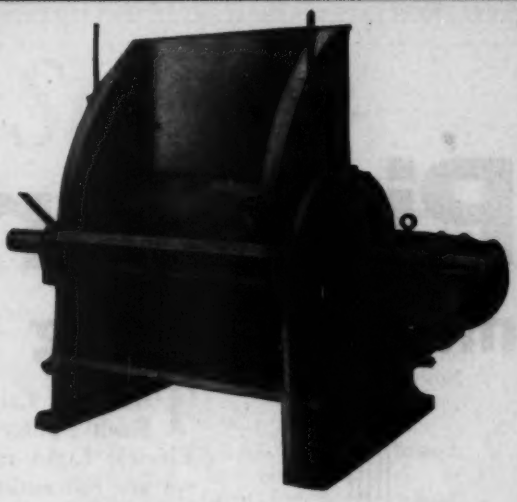
Miscellaneous—E. Dietzgen & Co., 43 cs. from Hamburg; Pacific National Bank, 17 cs. from Hamburg; Pennsylvania Railroad Co., 55 cs. from Hamburg; J. W. Hampton Jr. & Co., 5 cs. from Hamburg; Heemsoth & Basse, 119 bls. from Rotterdam and 9 cs. Bordeaux; Japan Paper Co., 10 cs. from Rotterdam, 51 cs. Genoa, 25 cs. Trieste, 67 cs. Havre and 18 cs. Yokohama; J. Beckhardt & Co., 28 cs. from Rotterdam, 6 cs. Bremen and 19 cs. Havre; S. Bienfang, 23 cs. from Rotterdam; New York Paper Co., 5 cs. from Rotterdam; Dennison Mfg. Co., 2 cs. from San Juan; G. W. Sheldon & Co., 15 cs. from Southampton and 4 cs. Havre; S. Gilbert, 91 cs. from Bremen; Hensel, Bruckman & Lorbacher, 28 cs. from Bremen 20 cs. Havre and 14 cs. Hamburg; E. Henningson, 11 cs. from Bremen; Keller-Dorian Paper Co., 40 cs. from Havre and 12 cs. Southampton; Coenca-Morrison Co., 12 cs. from Havre; Tamm & Co., 8 cs. from Rotterdam and 11 cs. Bremen; E. M. Sergeant Co., 3 cs. from Gothenburg; B. F. Drakenfeld & Co., 20 cs. from Liverpool; S. Markwalter, 3 cs. from Havre; Globe Shipping Co., 16 cs. from Rotterdam; International Forwarding Co., 27 cs. from Hamburg, 27 cs. Rotterdam, 36 cs. Antwerp and 3 cs. Bremen; American Express Co., 100 cs. from Hamburg, 70 cs. Havre and 7 cs. Rotterdam; Maritime Inspecting & Forwarding Co., 24 cs. from Havre; Atlantic Forwarding Co., 9 cs. from Hamburg; W. A. Foster, 3 cs. from Southampton, 71 cs. Glasgow and 3 cs. London; P. H. Petry & Co., 11 pkgs. from Havre; Van Oppen & Co., 30 cs. from Genoa; Vernon Bros. Co., 52 cs. from Glasgow; Manufacturers Trust Co., 11 bls. from Antwerp; F. Murray Hill, Inc., 13 cs. from Bremen and 3 cs. Bordeaux; J. J. Shore & Co., 65 cs. from Bremen; Henschel, Naeve & Co., 22 bls. from Bremen; D. F. Young, 26 cs. from Bremen; C. Redden, 6 cs. from Hamburg; J. E. Bernard & Co., 10 cs. from Gothenburg; Gershel & Neuman, 20 cs. from Havre; H. Reeve Angel & Co., 3 cs. from Antwerp; Borden & Riley Paper Co., 9 cs. from Antwerp; Dingelstedt & Co., 5 cs. from Antwerp and 25 cs. Rotterdam; Whiting-Patterson Co., 8 bls. from Southampton; Steiner Paper Corp., 12 cs. from Kobe and 20 cs. Rotterdam; A Flinn & Co., 4 cs. from Havre; Stern, Stiner & Co., 2 cs. from Havre; W. L. Haas, 8 cs. from Rotterdam; Walker Goulard Plehn Co., 15 bls. from Rotterdam; Central Hanover Bank & Trust Co., 50 cs. from Hamburg; W. C. Sullivan, 12 cs. from Hamburg.

Hans Lagerloef is Fifty Years Old

Hans Lagerloef, general manager of Lagerloef Trading Company, Inc., New York, celebrated his fiftieth birthday on Saturday, March 29.

The Finnish woodworking industries and Mr. Lagerloef are practically identical so far as the United States, Canada, Cuba and Mexico are concerned, as for twelve years he has been the sole representative in these large markets for the Finnish Cellulose Union and the Finnish Pulp and Board Union. Born in Sweden, as a young man Mr. Lagerloef studied commercial matters in Germany, France and England and subsequently was sent to the United States with a commercial scholarship granted by the Swedish government. Soon after his arrival here he was offered a leading post in the timber department of Aspegren & Co., New York, and two years later was made a manager and partner of the firm Jean Freese which he held until 1907 when, together with some friends, he started the firm Scandinavian-American Trading Company, whose president and general manager he became. Early in 1918 he founded his own firm Lagerloef Trading Company Inc., which is one of the largest and best known wood pulp agencies in the United States.

The Chicago office of the Foster Wheeler Corporation, has been moved to the Civic Opera Building, 20 N. Wacker Drive.



M&M Shredders are designed and built to handle practically every kind of paper stock—including kraft, sheet sulphite, machine broke, lap and roll stock, and old books and magazines.

MITTS & MERRILL

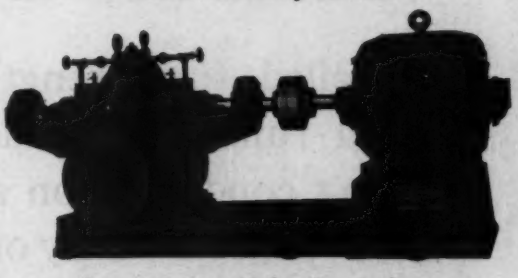
1013 Tilden St. Saginaw, Mich.

Builders of machinery since 1854

LAWRENCE

"VORTEX" CENTRIFUGAL PUMPS

"Built for every service"



—give utmost satisfaction in low-cost, dependable service—

In every type of service—water works, filtration plants, construction work, irrigation, dredging, sewage, etc.—you will find LAWRENCE "VORTEX" Centrifugal Pumps giving thoroughly satisfactory service. Continuous operation over long periods of time without repair cost is an outstanding feature.

Specify pumps that have proved they give that sort of dependable service.

Lawrence Pump & Engine Co.

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New York Office:—90 West Street

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Pioneers in manufacturing WIRE PRODUCTS

THE Wm. Cabble Co. was established in 1848. Before the "Gold Rush", before the Civil War, before the Telephone or Telegraph, Electric Light or Automobile or any of the Modern Inventions. But we are not antiquated or out-dated. Modern methods prevail at our plant because we are proud of our record of producing nothing, for over three quarters of a century, but the *best* wire products.

During this long period we have *specialized* in the manufacture of brass and phosphor bronze Fourdrinier Wires, Cylinder Covers, Washer Wires and Save-all Wires.

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BROOKLYN, N. Y.

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CABBLE
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WIRE MFG. CO.

THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

Made by

DRAPER BROTHERS COMPANY

CANTON, MASS.

Woolen Manufacturers Since 1856

REPRESENTATIVES

L. H. BREYFOGLE, Kalamazoo, Mich. INTERNATIONAL TRADING CO., Philadelphia, Pa.

PACIFIC SALES COMPANY, Security Bldg., Portland, Ore.

Foreign Trade Opportunities

The following foreign trade opportunities are issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce. Those interested are requested to communicate with the Bureau at its offices in Washington or New York or its branch offices in other cities, in every case mentioning the number of the inquiries referred to.

No. 44570—Paper bottles. Montreal, Canada. Purchase and agency desired.

No. 44529—Cardboard and felt, tarred and waterproofed. Milan, Italy. Agency desired.

No. 44617—Paper cups. Buenos Aires, Argentina. Purchase desired.

No. 44518—Envelope-making machines. Mukden, China. Purchase desired.

No. 44618—Machinery and equipment for the manufacture of paraffined boxes, paper cups and plates. Madrid, Spain. Sole agency desired.

No. 44517—Parchment paper substitute, and white sulphite wrapping paper. Berlin, Germany. Agency desired.

No. 44537—Printing paper. Cairo, Egypt. Purchase desired.

No. 44619—Chemical wood pulp. Milan, Italy. Agency desired.

No. 44516—Wrapping paper, for fruit. San Juan, Porto Rico. Agency desired.

No. 44540—Sulphur. Hamburg, Germany. Agency desired.

No. 44743—Soda ash and caustic soda. Antwerp, Belgium. Agency desired.

No. 44762—Writing paper. Bombay, India. Purchase desired.

No. 44673—Writing paper, flat. Paris, France. Purchase desired.

No. 44769—Paper mill installation complete with power plant. Mukden, China. Purchase desired.

No. 44909—Box cover paper, fancy. Glasgow, Scotland. Purchase desired.

No. 44906—Building board. Hamburg, Germany. Agency and purchase desired.

No. 44886—Stencil paper for duplicating machines, 2,500 sheets monthly. Prague, Czechoslovakia. Purchase desired.

No. 44885—Wallboard. Melbourne, Australia. Purchase desired.

No. 44807—Wall paper. Amsterdam, Netherlands. Agency desired.

No. 44819—Wrapping paper. Neuilly, France. Agency desired.

No. 44855—Writing paper, flat and boxed; paper boxes, and packing paper cut in rolls and reams. Cairo, Egypt. Agency desired.

No. 44941—Paper bags and packing paper. Havana, Cuba. Agency desired.

No. 44893—Blotting, tissue and copying paper, and paper specialties. Hamburg, Germany. Agency desired.

No. 44997—Paper for copying designs and drawings. Lisbon, Portugal. Agency desired.

Bell Telephone Service Opens to South America

Regular telephone service between North and South America has been inaugurated by the American Telephone and Telegraph Company. This service extends to all Bell System telephones in the United States and all telephones in Cuba, as well as to all important points in Canada and Mexico. In South America it includes the telephones of Argentina and of the cities of Santiago, Chile, and Montevideo, Uruguay. The daily service period is from 9 a. m. to 5 p. m., New York time.

A 5,300-mile short wave radio telephone circuit connects the overseas radio stations of the American telephone and Telegraph Company in the United States with the International Telephone and Telegraph Corporation stations in the vicinity of Buenos Aires, Argentina. The charge for a conversation between New York and Buenos Aires is $36 for the first three minutes and $12 for each additional minute. Rates

Starch—

A SIMPLE change in the manufacturing process often results in a pronounced decrease in cost of production.

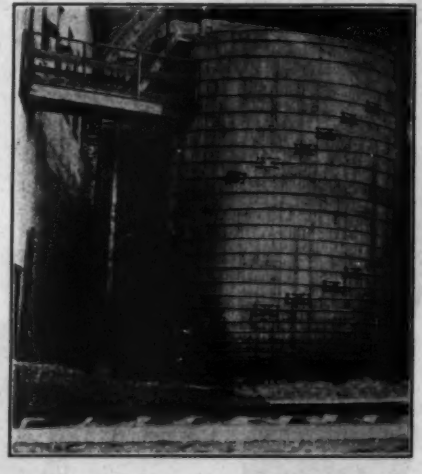
Paper Mills use Starch for sizing to produce better and stronger sheets with lower cost of manufacture.

Our SPECIAL PAPER brand, furnished in either Pearl or Powdered form for beater-sizing, increases strength of sheet and gives improved finish.

Our FOX HEAD brand for top-sizing is more economical than all glue-size.

CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York City

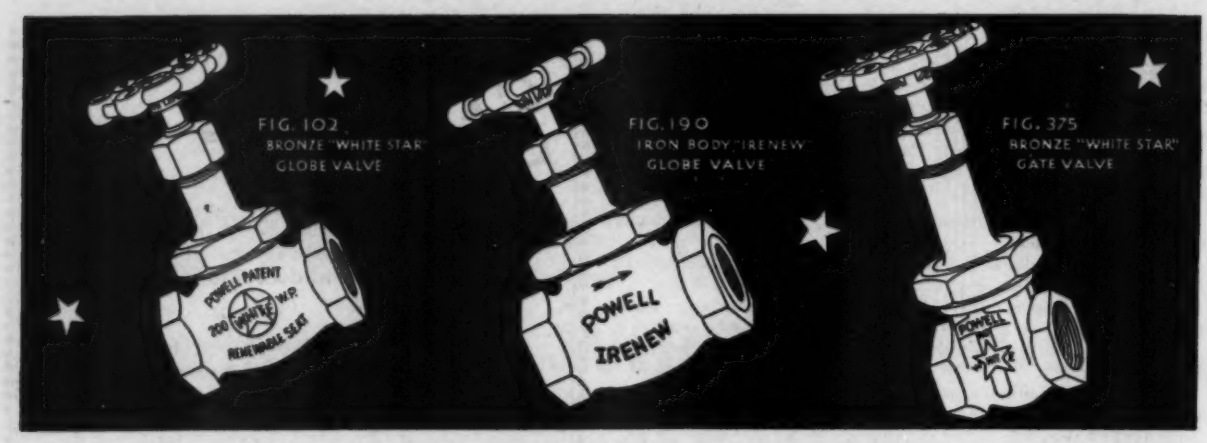
TANKS THAT LAST



Acid tank at Nekoosa-Edwards Paper Company, Pt. Edwards, Wis.

Kalamazoo tanks are made of best obtainable tank woods, built right—guaranteed tight.
Sixty years experience building Blow Pits, Acid Tanks, Stuff Chests, Agitators, etc., for the Paper Trade.
See our condensed catalog in Paper & Pulp Mill Catalog, Chemical Engineering or Sweets.
Ask about our new Tile Tanks for stock or bleach.

KALAMAZOO TANK & SILO CO., Kalamazoo, Mich.



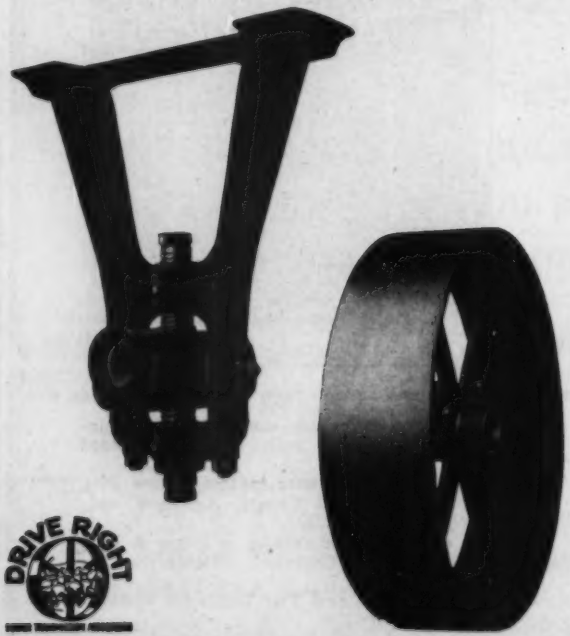
POWELL Valves, like stalwart sentinels, are dependable guardians for your pipe lines. Carefully processed from quality materials, they reflect long life and dependability in controlling steam, air, water, gas and oil lines—preventing costly leaks.

POWELL Bronze, Iron and Steel Valves are safe-guards for every service. They are designed in globe, angle, check, and gate patterns for pressures from 75 pounds to 2000 pounds, at temperatures from 450 degrees to 1000 degrees Fahrenheit.

THE WM POWELL CO., 2521-31 SPRING GROVE AVE., CINCINNATI, OHIO

★ POWELL VALVES

WOOD'S



DRIVE RIGHT

POWER TRANSMISSION MACHINERY

It is good management to place responsibility for merit of a product, or a specialized service, with that organization which works with heart and mind to insure the utmost satisfaction from the service their product renders throughout years of use.

Such an organization is the T. B. Wood's Sons Co. For more than seventy years we have served the manufacturers of this country in solving their problems of Power Transmission, and installing approved Power Transmission machinery and equipment.

Whenever improvements in your Power Transmission equipment are undertaken with the object of increasing production and lowering cost—thereby in time returning the original investment—we will gladly place our experience at your service without obligation.

T. B. Wood's Sons Co.
Chambersburg, Pa.

Makers of Shafting, Hangers, Couplings, Rope Drives, Pulleys, Friction Clutches, Pillow Blocks, Flexible Couplings, the U. G. Automatic Belt Contactor, Texrope Drives, Conveyors and Ball Bearings.

for other points beyond New York or Buenos Aires are slightly higher depending on the distance.

The American Telephone and Telegraph Company's short wave radio telephone transmitting center at Lawrenceville, N. J., is the point for sending while the receiving station for voices from South America is at Netcong, N. J., which also receives short wave radio telephone transmission from Europe.

The transmitting and receiving stations in South America are at Hurlingham and Platanos respectively. Both stations are situated a few miles from Buenos Aires.

In the United States the two radio channels are brought together to form a complete conversation in the long distance office of the American Telephone and Telegraph Company in New York, while in South America they are joined at Cuyo, the overseas terminal for Buenos Aires.

In driving the voice through 5,380 miles of space, the Lawrenceville station is fitted with a transmitter for amplifying it several millions of time. It operates a great screen antenna suspended on seven 180 foot steel towers. The receiving station at Netcong must build up the power of the weakened voice waves from South America before they can be passed on to North American telephones.

Calls are handled through "long distance" in the same manner as any other out-of-town call. When the operator answers, subscribers just ask for the South American operator.

Cost Association No Longer a Separate Organization

In an announcement under date of April 28, 1930, Thomas J. Burke, former secretary of the Cost Association of the Paper Industry, informs the members that the association has been taken over by the American Paper and Pulp Association and will hereafter be conducted as a Cost Department of the association. The announcement, headed "A Valedictory and a Salutatory," sent out by Mr. Burke reads as follows:

"The Cost Association as a separate organization now lives only in its creditable record of achievement. But it is far from being moribund.

"It has been re-created as the Cost Department of the American Paper & Pulp Association, with wider opportunities for service in a field which has not ceased to need the stabilizing effect of sound accounting methods.

"While this change has been discussed for several years, and was recommended by at least two special committees of the American Paper & Pulp Association, the movement came to a head at the last annual meeting of the American Paper & Pulp Association through a proposal submitted by its general manager, Mr. Jesse H. Neal.

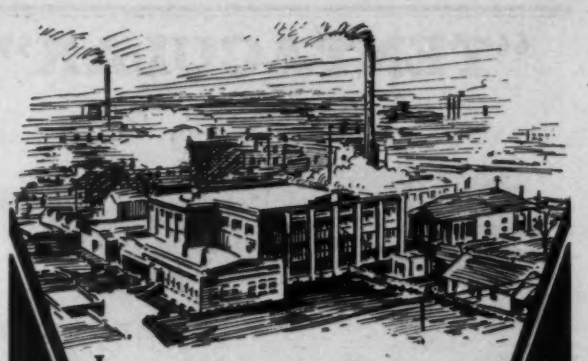
"Our executive committee voiced its unanimous approval of this consolidation on April 16, and having been passed upon favorably by the executive committee of the American Paper & Pulp Association, the Cost Department of the latter association has been instituted as of April 15th.

"Mr. Neal has announced the appointment of the undersigned as the first director of the Cost Department. In a few days Mr. S. L. Willson, president of the American Paper & Pulp Association, will appoint a Cost Committee.

"From now on no separate funds or dues will be collected for the support of our work. The Cost Department will be financed from the funds of the American Paper & Pulp Association, just as are its other departments.

"Members of the late Cost Association who are not members of the American Paper & Pulp Association do not become members through this consolidation. I am authorized however, to extend such mills a cordial invitation to consider the advisability of participating in the work and benefits of the American Paper & Pulp Association.

"The parent association has taken on new life which belies its age of fifty-three years; it is being financed on an adequate basis as well as an equitable one, and has adopted a progressive program of work which should go far to create better conditions for the making and selling of paper and paper products. It deserves your active co-operation, and invites your advice and suggestions."



In this modern paper mill there are more than nineteen thousand dollars worth of Lewellen Transmissions and Lewellen Automatic Controls. Wherever accuracy in production is required the Lewellen Variable Speed Controls will meet the demand.

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LEWELLEN VARIABLE SPEED TRANSMISSION

LEWELLEN MANUFACTURING CO
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"TENTACULAR" Transmission Belt

can not perform miracles

. . . but—

It will remedy hot bearings, shaft buckling, lack of speed, and power losses. It will decrease tension, therefore increase Horse Power capacity.

Tentacular increases pull and works satisfactorily on drives where an ordinary flat belt is laboring—and does all this with no slip—no change in pulley sizes and without an idler.

Tentacular for the transmission of power on Paper Mill Drives is unrivalled.

SIMPLE
ECONOMICAL
EFFICIENT
(over 98%)

We can prove from comparative tests that Tentacular is far more efficient than any other type of drive.

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Sole Makers of — Tentacular Transmission Belt

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Alexander Brothers INC.

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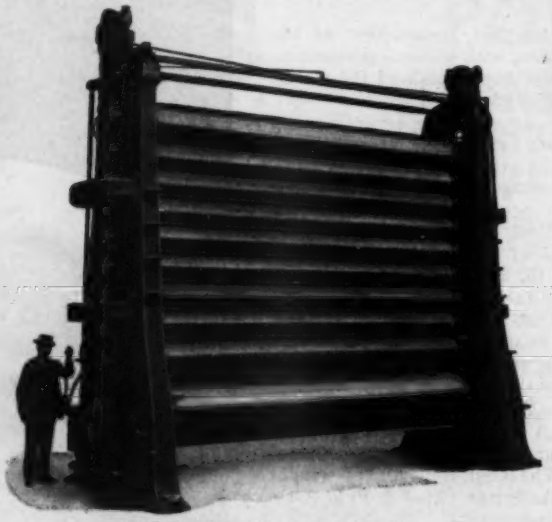

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FARREL NEW TYPE ROLL GRINDER—ELECTRICALLY DRIVEN THROUGHOUT
Built in 24", 32", 36" and 42" sizes. Fitted with Geared Head, New Crowning Device and Automatically Lubricated

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